GENERAL TELEPHONE

COIN TELEPHONE HANDBOOK

FOREWORD

This handbook is intended to be used by installation and maintenance craftsmen in their daily job.

The objective is to provide you with the minimum number of GTE Practices needed for the every day type jobs.

Your Supervisor will have a complete set of GTE Practices in his office.

It is anticipated that this handbook will be replaced at twelve month intervals.

Any suggestions, comments or recommendations regarding this handbook should be transmitted through normal lines of organization using Form S 4206 to: Manager – GTE Practices, GTE Automatic Electric Incorporated, Northlake, Illinois. Exhibit 1 is a sample of Form S 4206.

FORM S 4206 (REV. 6-71)
REF: GTEP 000-010-010

GTE PRACTICES

Comments, Requests or Recommendations

TO: MANAGER–PRACTICES
GTE AUTOMATIC ELECTRIC
DEPARTMENT 600
400 N. WOLF ROAD
NORTHLAKE, ILLINOIS 60164

GTEP NUMBER (If Known)	ISSUE	TITLE OR OTHER IDENTIFICATION

☐ Suggested Revision ☐ Request For New Practice ☐ Other

☐ Date Required _____

TO BE COMPLETED BY ORIGINATOR

DESCRIPTION OR COMMENTS

SUBMITTED BY (Name)	TITLE	AREA CODE – TELEPHONE NO.	DATE SUBMITTED

COMPANY NAME	ADDRESS	☐ ATTACHMENT(S)

TO BE COMPLETED BY PRACTICES DEPARTMENT, NORTHLAKE

ACTION TAKEN AND STATUS

ACTION TAKEN BY (Practices Supervisor)	AREA CODE – TELEPHONE NO.	DATE ACTION TAKEN	ESTIMATED STARTING DATE	ESTIMATED COMPLETION DATE

REVIEWED BY Manager–Practices	DATE	DATE REPLY COPY SENT	PROJECT NUMBER
			6616

ORIGINATOR – Retain Yellow Copy
Send White and Pink Copies to PRACTICES DEPARTMENT, NORTHLAKE

Exhibit 1.

COIN TELEPHONE HANDBOOK
TABLE OF CONTENTS

Table of Contents (Cont'd)

Table of Contents (Cont'd)

Table of Contents (Cont'd)

SECTION 476-201-100
ISSUE 2, MAY, 1972
GTE STANDARD

GTE AUTOMATIC ELECTRIC
TYPE 120A (SINGLE-SLOT) COIN TELEPHONE SET
DESCRIPTION AND INSTALLATION

CONTENTS PAGE

1. GENERAL

1.01 This section presents the description, operation and installation of the GTE Automatic Electric Type 120A single-slot coin telephone set (Figure 1). This telephone set supersedes the conventional three-guage coin telephone sets. The Type 120A coin telephone set is available in both rotary dial and Touch Calling versions. The telephone set is furnished equipped and wired for Prepay service but can be modified for Semi-postpay service.

1.02 This section is being reissued to incorporate changes and to replace Section 476-201-100, Issue 1, a GTE Special, with 476-201-100, Issue 2.

2. FEATURES

2.01 In addition to improved appearance and greater ease of operation, the single-slot coin telephone set offers other operational, design and circuit advantages.

Operational Features

2.02 The single-slot telephone set incorporates the following operational features:

(a) Increased resistance to vandalism.

(b) Economical conversion to revised initial-period calling rates.

(c) Easy conversion from Semi-postpay to Prepay operation or vice versa.

(d) Easy conversion from rotary dial to Touch Calling service.

(e) Near-total elimination of revenue loss from slugs through the use of a sophisticated rejector mechanism.

(f) Improvement in toll operating efficiency due to the use of an audio oscillator to generate coin identification tone signals.

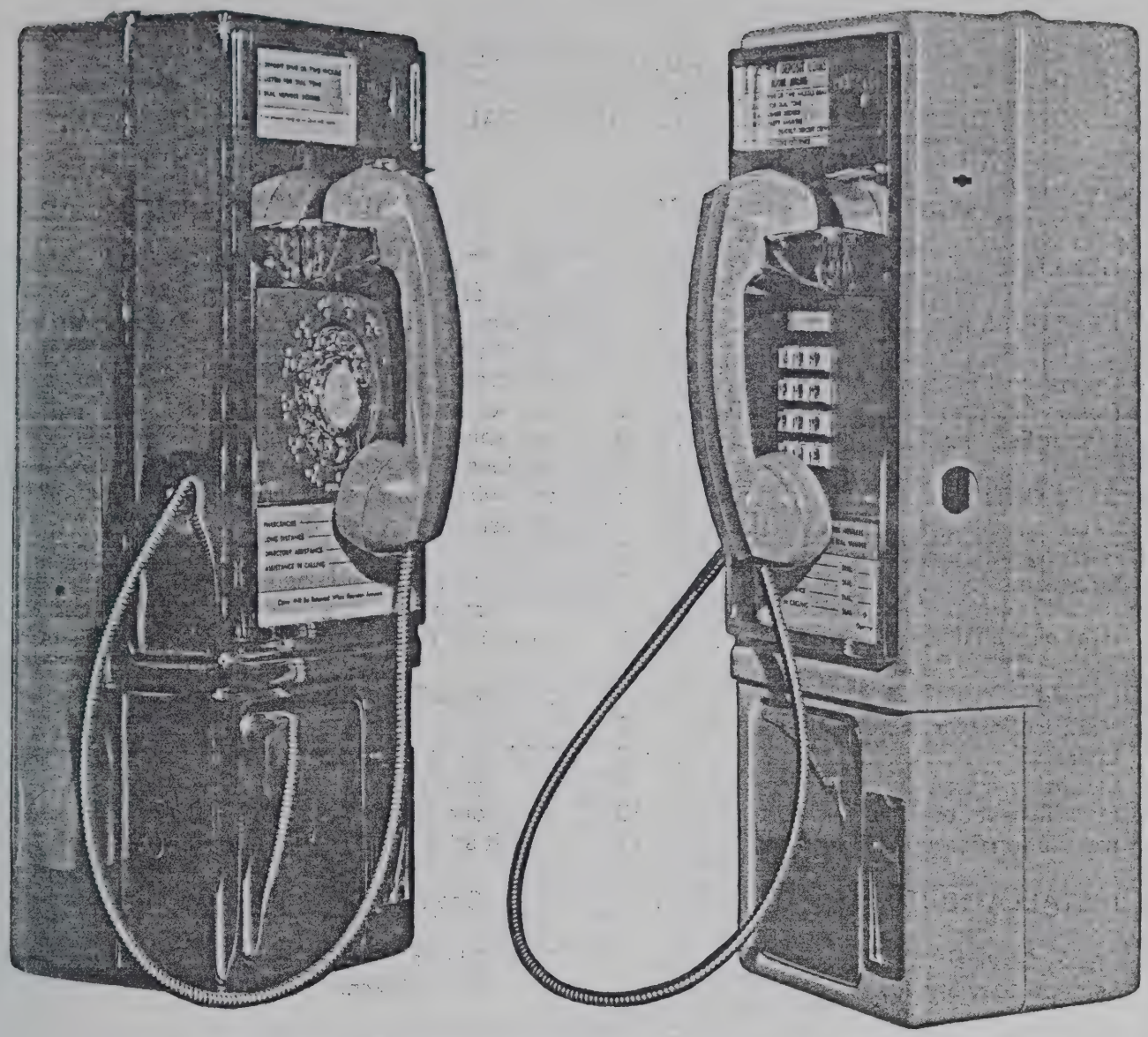


Figure 1. GTE Automatic Electric Type 120A Coin Telephone Sets.

Design Features

2.03 The following design features are incorporated into the design of the single-slot coin telephone set:

(a) All steel housing construction, except appearance items.

(b) Extra heavy gauge steel cash vault door.

(c) Tongue and groove construction for mating surfaces of upper and lower housings and lower housing and cash vault door.

(d) Critical security areas such as rim around cash vault door protected by hardened steel liners.

(e) Foolproof latching mechanism and lock for upper housing and cash vault door.

(f) Provisions for increased cash vault size. (50% greater capacity than the one used on three-gauge coin telephone sets.)

(g) Provisions incorporated for mounting of alarm switches.

(h) Upper housing accepts either rotary dial or Touch Calling unit.

(i) Snap-in mounting of covers for instruction cards.

Circuit Features

2.04 Through various strappings on the Interface and Totalizer printed wiring cards, the Prepay coin telephone can be used in the standard (conventional) Prepay mode of operation, coin-free emergency calling Prepay mode, and Semi-postpay mode.

2.05 In either mode of Prepay service, collection or refund of coins may be made at any time even though the coin relay connection may be held open by the rate relay. Application of coin battery to the line causes the control circuit of the rate relay to release the relay immediately and connect the coin relay to the transmission unit.

2.06 The single-slot set will operate with offices that send coin battery over one side of the line only or both sides simultaneously. This feature allows the set to be used in offices that still serve conventional three-gauge sets with the older two-coil coin relay which requires the higher current available from paralleling the loop conductors. It also allows use of the set from offices that serve other manufacturer's coin telephones which may require coin battery to be sent over one side of the line only for proper coin relay operation.

2.07 To permit use of the instrument in either Prepay or Semi-postpay service, zero reset of the totalizer at the end of a call is triggered as the loop is opened on disconnect. Reset occurs after a slight time delay to avoid undesired reset on an accidental hookswitch flash by the user should it occur prior to completion of dialing. The reset delay is short enough, however, to prevent reseizing of a new line before zero reset of the totalizer.

2.08 For Semi-postpay service or Prepay service where normal polarity is maintained to the telephone set, a special Touch Calling unit prevents generation of single tones by operation of two keys if simulation of coin deposit tones is attempted on operator calls. If reverse battery supervision is returned in Prepay service, such as a call being served from a TSPS installation, the Touch Calling unit will be disabled as a further measure to prevent its use to simulate coin deposit tones.

3. DESCRIPTION

Housing

3.01 The housing of the new coin telephone set instrument is of all-steel construction, except for appearance items, and measures 21 inches high, 7-5/8 inches wide and 6 inches deep. The upper and lower housing shells are formed of deep-drawn steel, and contain reinforcing members welded in place. Extra heavy gauge steel is used for the cash vault door, which also uses reinforcing members. To reduce the possibility of gaining access to the interior of the set, a tongue-and-groove type of construction is used at the mating surfaces of the upper and lower housings, and of the lower housing and the cash vault door. Critical security areas, such as the rim around the cash vault door, are further protected by the use of hardened steel liners which retard attempts to drill into the housing at these points.

3.02 Retention of the upper housing (Figure 2) to the lower housing (Figure 3) is effected by a slide-bar latch which secures the two at six points and is actuated by a T-shaped tool, Figure 4, formed of rod stock and drilled to accept a short pin near the base of the T. An opening at the upper right side of the upper housing permits entry of the tool to engage the latch, but the latter may be held in the closed position by a studded cam actuated by a cylinder lock of unique design located about midway up the right side of the telephone set, in the upper housing.

3.03 The cash vault door is secured in place by a similar four-point latching mechanism engaged by inserting the T-shaped tool into an opening in the center of the door's surface. In this case the latch is secured by a four-tumbler cylinder lock, located on the left side of the lower housing.

3.04 The pattern of mounting holes in the lower housing, and the relationship of the wire entry opening to the mounting holes, is the same as that used on present three-gauge coin telephone sets, in order to permit mounting in the same booths or other pre-drilled locations. An additional pattern of mounting holes behind the vault area is provided for easier access, and may be used when mounting to a metal backboard. Unlike present sets, however, the lower housing has no rear channel to permit top or bottom wire entry in surface-wired installations. For this and other

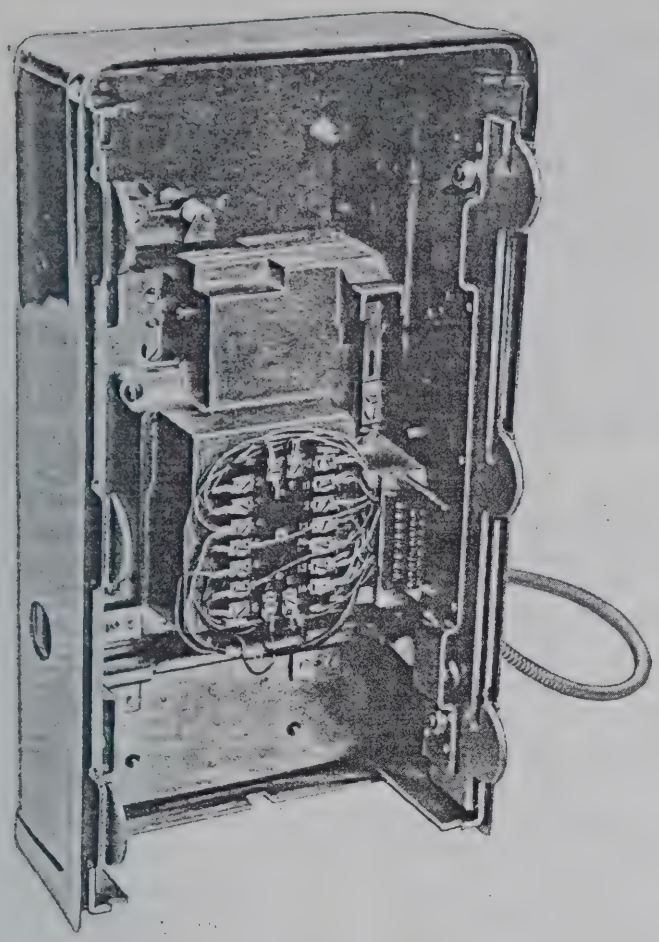


Figure 2. Upper Housing.

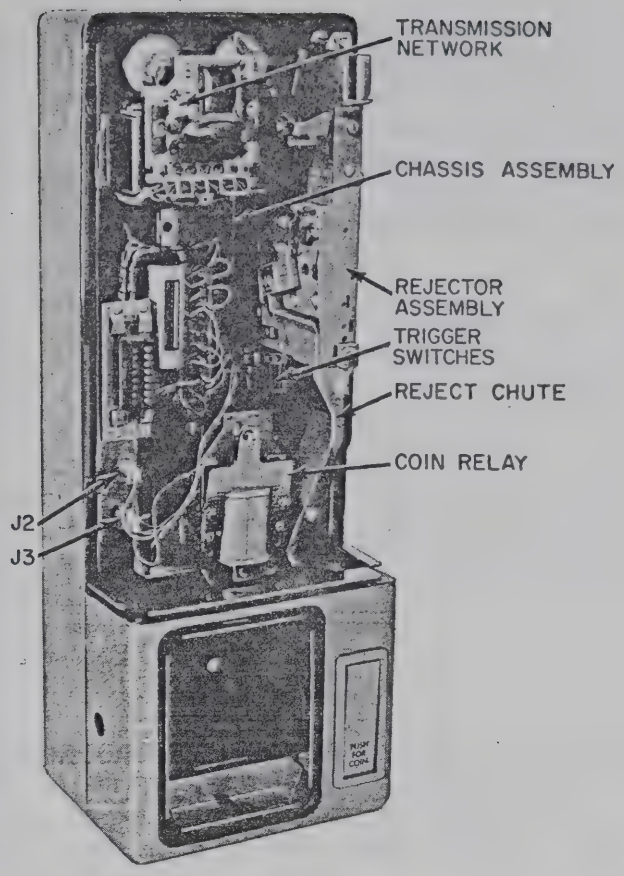


Figure 3. Lower Housing.

installation requirements a metal backboard is available for separate ordering. Provision is made for the use of four security studs in mounting.

3.05 The cash vault is furnished with a false floor which covers the support spring for the new, larger, coin receptacle and provides a separate, higher support spring suitable for use with the standard-sized receptacle. If the larger coin receptacle is preferred, this floor may be removed and discarded.

3.06 Provision is made for the mounting of snap-action microswitches at two points within the set when required for transmission of alarms in the event of unauthorized entry. When so mounted, one switch is positioned with its actuator bearing on the slide-bar of the upper housing latching mechanism, and the other with its actuator bearing on the similar mechanism of the cash vault door. The switches and associated mounting hardware will be made available for field installation.

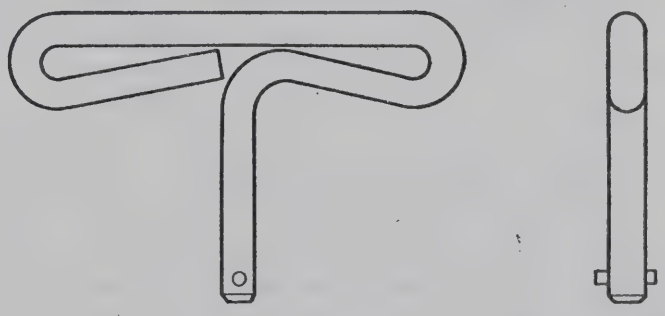


Figure 4. T-shaped Tool.

3.07 Standard finish for the upper and lower housings is chrome or black and beige vinyl paint which is highly resistant to abrasion and chemical attack. Light texturing of the finish provides a pleasing appearance while it also conceals welding marks where internal parts are anchored to the housings. The handset hanger, coin return receptacle, vault door, faceplate and coin release lever are chrome plated.

3.08 The coin return receptacle is provided with a top hinged door at the right front of the lower housing. Returned coins enter the receptacle from a passage behind the door and collect just below the bottom of the door. The floor of the receptacle extends to the rear and upward to form a trough for holding coins. When the door is opened, coins are accessible to the customer while the passage by which coins enter the receptacle is blocked off. The rearward extension of the trough appears to be the passage from which coins enter, but it may be stuffed to no avail since the actual passage is protected from stuffing by the opened door.

3.09 The upper housing is designed to accept either a rotary dial or a Touch Calling unit by proper choice of a porcelain-enamel finished adapter plate and cover. Rotary dial coin telephone sets use a non-lighted version of the Type 54 dial with three makes in the off-normal spring assembly, while the Touch Calling instruments are equipped with a special weather protected Touch Calling unit arranged with an extra set of frequence-selecting contacts to prevent generation of single tones by simultaneous operation of two keys in the same row or column. A rotary dial coin telephone set can readily be converted for Touch Calling operation by simple replacement of the upper housing as a field operation. The upper housing of a rotary dial set can be converted to Touch Calling service in the repair shop by replacing the adapter plate, cover and dial with their Touch Calling counterparts.

3.10 On rotary dial coin telephone sets a clear polycarbonate fingerwheel is used in conjunction with an adapter which provides greater rigidity in mounting to the clamping disc on the pawlplate of the mainshaft. The fingerwheel lies nearly flush with the faceplate, to make it less susceptible to prying.

3.11 The upper housing contains a dial housing to which is mounted the rotary dial or Touch Calling unit, switch lever and hookswitch, together with a 16 ribbon-contact plug and a terminal board. Leads from the various components and the plug are interconnected at the terminal board. The dial housing plug makes contact with a float mounted receptacle on the chassis in the lower housing as the upper housing is pushed into place, thus eliminating the problem of trying to insert a separate plug while holding the upper housing in position.

3.12 A stationary handset hanger is mounted on the front of the upper housing. The hookswitch is actuated by a lever which projects through an opening in the housing between the support points of the hanger. An armored handset cord is furnished as standard equipment and arranged for entry on the left side of the housing to minimize tangling.

3.13 The faceplate of the upper housing has two openings for recessing instruction cards. An upper instruction card, 2 inch x 2-3/4 inch in size is located to the left of the coin slot and provides information on how to operate the coin telephone set, while a 2-1/2 inch x 6-1/8 inch lower panel card furnishes service codes and other call data individual to a given area. The cards and their clear plastic windows are arranged for snap-in mounting on the faceplate.

Subassemblies

3.14 The lower housing of the Type 120A coin telephone set (Figure 3) consists of three major subassemblies; rejector mechanism, coin relay-hopper and chute assembly, and chassis assembly.

3.15 REJECTOR MECHANISM — The rejector mechanism is fastened to a mounting plate which is held in place by a tab and one captive screw. A reject chute (connecting the rejector mechanism and coin relay return outlets to the coin return receptacle) can also be removed by loosening one captive screw.

3.16 The rejector mechanism (Figure 5) is a sophisticated coin testing device for accepting a very high percentage of genuine coins and rejecting the majority of slugs encountered in the field. As coins enter the rejector, they are sorted into the three general size categories of a quarter, nickel and dime. Thereafter, coins are tested in their own individual channel. Each coin is first checked for proper diameter and weight. If it meets these requirements it is checked for a perforation, (such as a washer) and is released down an inclined rail. As the coin rolls down the rail it is tested for proper thickness and then passes by a permanent magnet. The magnet generates eddy currents within the coin if it is metallic and tends to retard its travel. If it not metallic, such as a plastic slug, there is no slowing of the slug as it passes the magnet. The material composition of the coin or slug determines the speed with which it

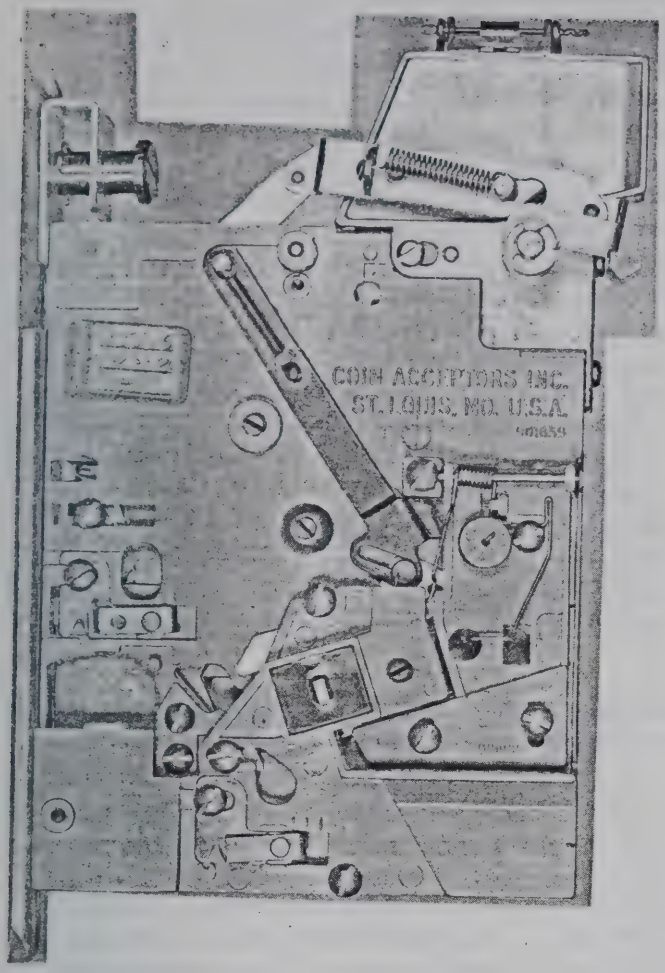


Figure 5. Rejector Mechanism.

leaves the inclined rail. If the coin travels too fast or too slowly, it will strike certain deflectors that cause it to be diverted to the reject outlet. In addition, the nickel is tested for hardness and elasticity to determine whether it will be accepted or rejected.

3.17 Most rejected coins will be diverted directly into the reject outlet and terminate in the coin return receptacle of the telephone. Ferrous slugs, oversize coins and washers become trapped in the rejector but can be released by operation of the coin release lever. As this lever is operated, it causes a separation of the hinged sides of the lead-in chute and rejector. This allows several fingers to extend into the coin channels and dislodge trapped coins. At the same time, wiper blades sweep past the magnets to clear the coin channels, directing the trapped coins to the coin return receptacle.

3.18 COIN RELAY-HOPPER AND COIN CHUTE ASSEMBLY – A coin relay-hopper and coin chute assembly (Figure 6) located below the rejector mechanism is retained near the top by a tab that drops over an opening in the reinforcing plate at the rear of the lower housing. The collect opening of the hopper extends through the floor above the coin box and is held in place via a movable rail which is locked with three screws.

3.19 Genuine coins leaving the rejector mechanism have been sorted into three channels. As a coin travels through the succeeding chute section, it operates the trigger switch associated with that denomination. Each trigger provides an input to the totalizer. Operation of the first chute trigger in turn actuates the coin relay trigger lever. After passing through the chute section, coins then fall into the coin relay-hopper and are channeled directly into the coin box in Semi-postpay service or they come to rest on a double trap door support in Prepay service.

3.20 The coin relay-hopper and coin chute assembly serves to dispose of the coins held suspended on the trap doors of the hopper. A wider hopper design accepts coins from an off-center entry point and retains them in random

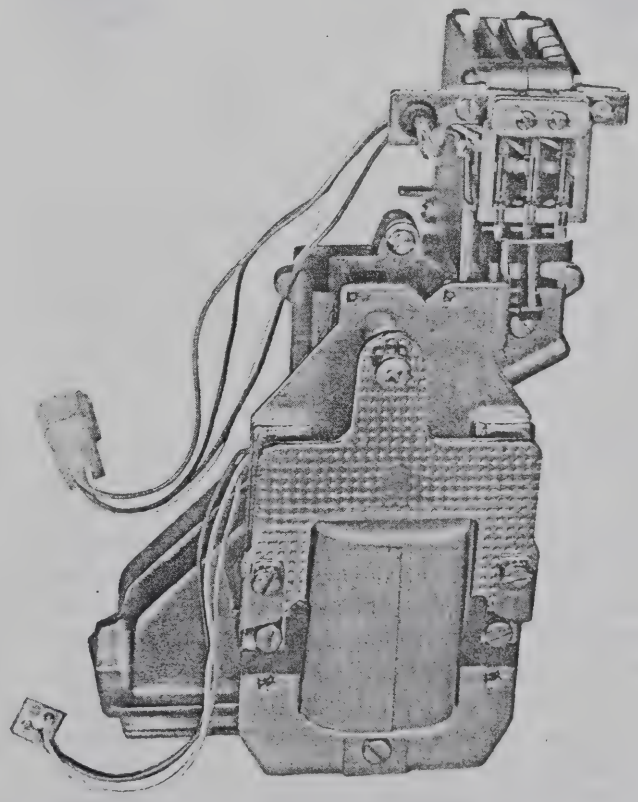


Figure 6. Coin Relay-Hopper and Coin Chute Assembly.

fashion. This allows a shorter hopper with the same capacity (approximately 20 quarters) as the single coil coin relay used in 3-gauge sets. Similar in operating principle to that relay, the new relay also features a polarized selector mechanism. During operation of the relay, the selector card is influenced by the polarity of the voltage applied to the relay. This causes the card to tilt as it moves downward and opens the proper trap door to collect or refund coins. Release of the relay resets the trigger lever and returns the trap door to the closed position in readiness for another deposit. As the relay operates it short circuits its own coil and substitutes a resistor in the circuit during the shorted period. The resistor provides circuit continuity and current limiting for the operator's coin lamp while the coil shorting feature allows the relay to operate completely on a 0.2 second pulse. Additionally, a long release time is provided by the shorted coil to ensure complete disposal of coins.

3.21 CHASSIS ASSEMBLY — The chassis assembly (Figure 7) mounted at the left side of the lower housing is retained by a tab and one captive screw. Mounted to the chassis is the transmission unit, a Type 45 ringer and three totalizer printed wiring cards. Electrical interconnection to other assemblies is made via connectors mounted on the chassis assembly. A float mounted 16-ribbon contact chassis connector provides circuit access to the components in the dial housing, a four-pin connector offers connection to the coin chute trigger, a three-pin connector affords connection to the coin relay, and a three-pin connector and terminal block located on the right side of the chassis provides connection to line terminations on the rear of the lower housing.

3.22 The primary function of the totalizer is to count and store the total value of the coins deposited. It also performs several other functions. As coins are received, the totalizer simultaneously mutes the coin telephone receiver and applies audio frequency signals to the line corresponding to the value of the coin deposited. On operator assisted calls these tones indicate the value of each coin deposited. The totalizer also controls the coin telephone by restricting either signaling or transmission until the initial rate has been deposited. The initial rate is set at the factory for ten cents but can be easily revised for any value from 5 cents to 35 cents in 5-cent steps by changing the position of three wiring straps on the rate register card.

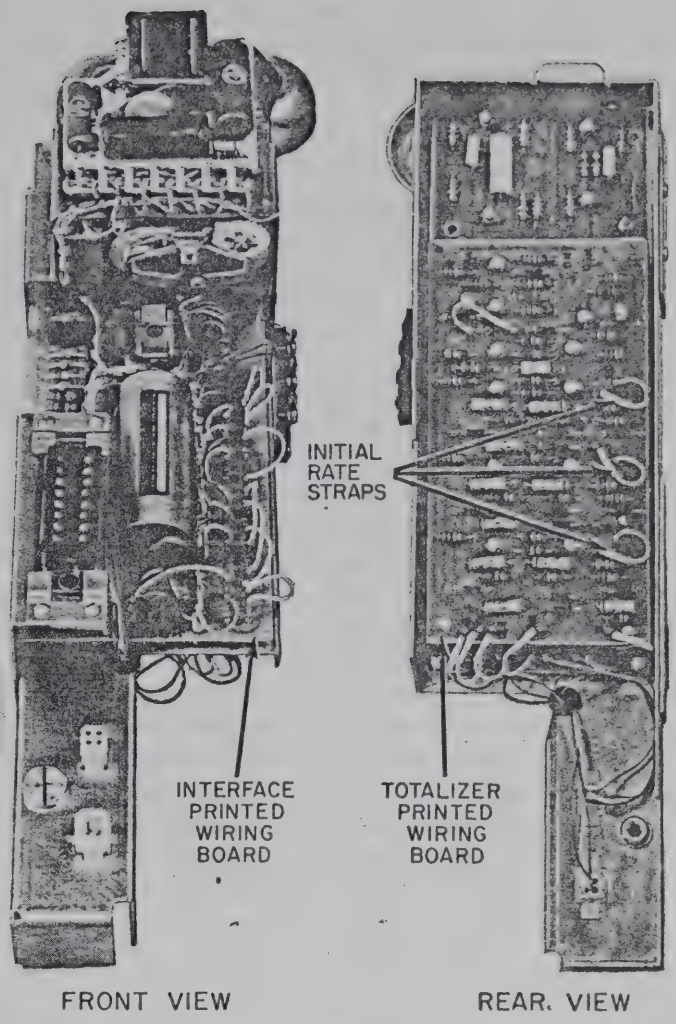


Figure 7. Chassis Assembly.

3.23 The totalizer is comprised of three printed wiring card assemblies; the coin pulse generator, the rate register, and the interface circuit. When a deposit is made, signals from the coin triggers are fed into the coin pulse generator where pulses of the proper number and duration are produced corresponding to the value of the coin deposited. These pulses are sent simultaneously to the rate register and the interface circuit. The rate register stores pulses generated by the coin pulse generator while the interface circuit converts the pulses to tone signals and applies them to the telephone line. A continuous output is also sent from the coin pulse generator to the interface circuit during the entire pulsing period to mute the receiver. This minimizes the level of coin tones reaching the user's ear, and also reduces the possibility of fraudulent usage of these tones. When the total number of pulses stored in the rate register equals the initial rate for which it is set, the

rate register signals the interface circuit. The interface circuit responds to this signal to make the telephone operative.

3.24 The interface circuit serves to make the logic section of the totalizer (coin pulse generator and rate register) compatible with the conventional telephone circuit. Included in the interface circuit is a regulated power supply, operated from line potential, to power all other totalizer circuits; an audio oscillator which the coin pulse generator keys as each coin is deposited; a receiver-muting control which is activated during the sending of tones; a unity gain one-way amplifier used to isolate the receiver to prevent its use as a transmitter in Semi-postpay service; and a rate relay and associated circuit to control the dial or Touch Calling unit, the coin relay and the transmitter. Three modes of operation are possible by changing the position of several straps on the interface circuit and one strap on the rate register.

3.25 If strapping on the interface printed wiring card is arranged for Prepay operation, the bi-stable rate relay responds to the presence of loop current and by its operation opens the path over which the coin relay contacts apply ground to the transmission-unit and disables the rotary dial or Touch Calling unit. Closure of the coin relay contacts on deposit of the first coin has no effect on the loop unless that coin satisfies the initial rate for which the totalizer has been strapped. When the total deposit equals that value, the totalizer causes the rate relay to operate, extending coin relay ground to the transmission unit and to provide the usual deposit indication to the central office, and enable the rotary dial or Touch Calling unit. While operated, the rate relay also serves to disable the dial or Touch Calling unit. If the instrument is to be used for coin-free emergency calling service, strapping on the interface printed wiring card is rearranged so the dial or Touch Calling unit is not disabled and the rate relay does not operate immediately upon initial rate deposit. To check for proper deposit, the central office briefly opens the loop. If the proper amount has been registered, this interruption in loop current will cause the rate relay to operate, applying coin relay ground to the transmission unit, but is again removed when loop current resumes. This minimizes the longitudinal current induced in the line from external sources, and thereby reduces hum and noise during conversation. The advantages of this type of operation are attained only through the use of the coin line repeater or adapter and associated equipment designed for emergency calling service and described in the 265-150 series of GTE Practices.

3.26 If strapping on the interface printed wiring card is arranged for Semi-postpay operation, the rate relay responds to the presence of loop current from normal battery, and by its operation connects the handset transmitter (and, in Touch Calling sets, the Touch Calling unit) for service. This permits proper operation on calls to free service numbers or to an operator on which battery feed remains normal. Receipt of reverse battery supervision on a completed call to a local number causes the rate relay to operate, disconnecting the transmitter and (in Touch Calling sets) disabling the Touch Calling unit to prevent free transmission of coded information via DTMF signals. At this time, the receiver is fully operative with normal sensitivity, so the called party's answer can be heard without impairment, but a unity-gain amplifier isolating the receiver from the transmission unit induction coil prevents use of the receiver as a transmitter. Deposit of the rate for a local call causes the totalizer to operate the rate relay and reactivate the transmitter and (in Touch Calling sets) the Touch Calling unit.

4. INSTALLATION

General

4.01 The Type 120A single-slot coin telephone set as furnished is equipped and wired for Prepay operation. The telephone set can easily be modified for Semi-postpay oneration. Refer to Paragraph 4.02 for modification procedures.

Modification for Semi-postpay Service

4.02 Use the following procedures to modify a Type 120A coin telephone set for Semi-postpay operation:

(1) Remove the upper housing.

(2) Remove the three mounting screws and coin relay from the coin hopper and relay assembly.

(3) Remove receptacle J3 from the chassis assembly and place the coin relay in stock for future use.

(4) On the interface card, make the following strapping changes.

(a) Strap I to Pin J, change to Pin H.

(b) Strap K to Pin L, change to Pin J.

(c) Strap O to Pin M, change to Pin U.

(d) Strap P to Pin U, change to Pin M.

(e) Strap V to Pin R, change to Pin T.

(f) Strap W to Pin T, change to Pin Y.

(g) Change wire strap between Pins Y and Z to between Pins P and O.

(5) Lock the hopper door in the collect position. This is done by moving the door with the pin located in the left bottom corner of the hopper assembly and locking the door in this position with a 4-40 x 3/8 inch machine screw. The screw is inserted into the tapped hole located adjacent to the door lever in the lower left hand corner of the hopper assembly.

4.03 The pattern of mounting holes in the lower housing, and the relationship of the wire opening to the mounting holes is the same as that used on the three-gauge coin telephone sets, to permit mounting in the same booths or other pre-drilled locations.

Location

4.04 The location where the coin telephone set is to be installed will be specified on the service order. The location should:

(a) Have sufficient light.

(b) Be free from excessive noise, vibration and dirt.

(c) Be clear of pedestrian and vehicle traffic.

(d) Be clear of glass counters, showcases, or other fragile objects.

(e) Have a 6-inch clearance from fluorescent lights, transformers and similar apparatus to avoid inductive interference.

Mounting

4.05 The surface on which the backboard is to be mounted should be sufficiently firm so that the backboard cannot be dislodged. The surface must be flat so that the backboard and coin telephone cannot be pried loose.

4.06 If the coin telephone must be located on finishes that would be expensive to repair if the set is removed, obtain instructions from your immediate supervisor before proceeding with the installation. Arrangements should be made to have the customer or building owner drill mounting and wire entrance holes through glazed tile, marble or other such surfaces. When mounting the single-slot coin telephone, a vertical surface must be provided. A tilt greater than 1-1/2 degrees in any direction will cause malfunction of the telephone. A vertical surface may be determined by the following steps:

(1) Place a spirit level vertically against the mounting surface with the top end of the level at the required height of the coin telephone.

(2) Move the top or bottom end of the level away from the mounting surface as required to obtain a vertical reading.

(3) When a vertical reading is obtained, the end of the level opposite the point of contact shall be no farther from the mounting surface as shown in Table 1.

(4) Ensure that a vertical surface is obtained in both directions.

4.07 Mounting of the coin telephone set in an aluminum booth is described in the 476-500 series of the GTE Practices.

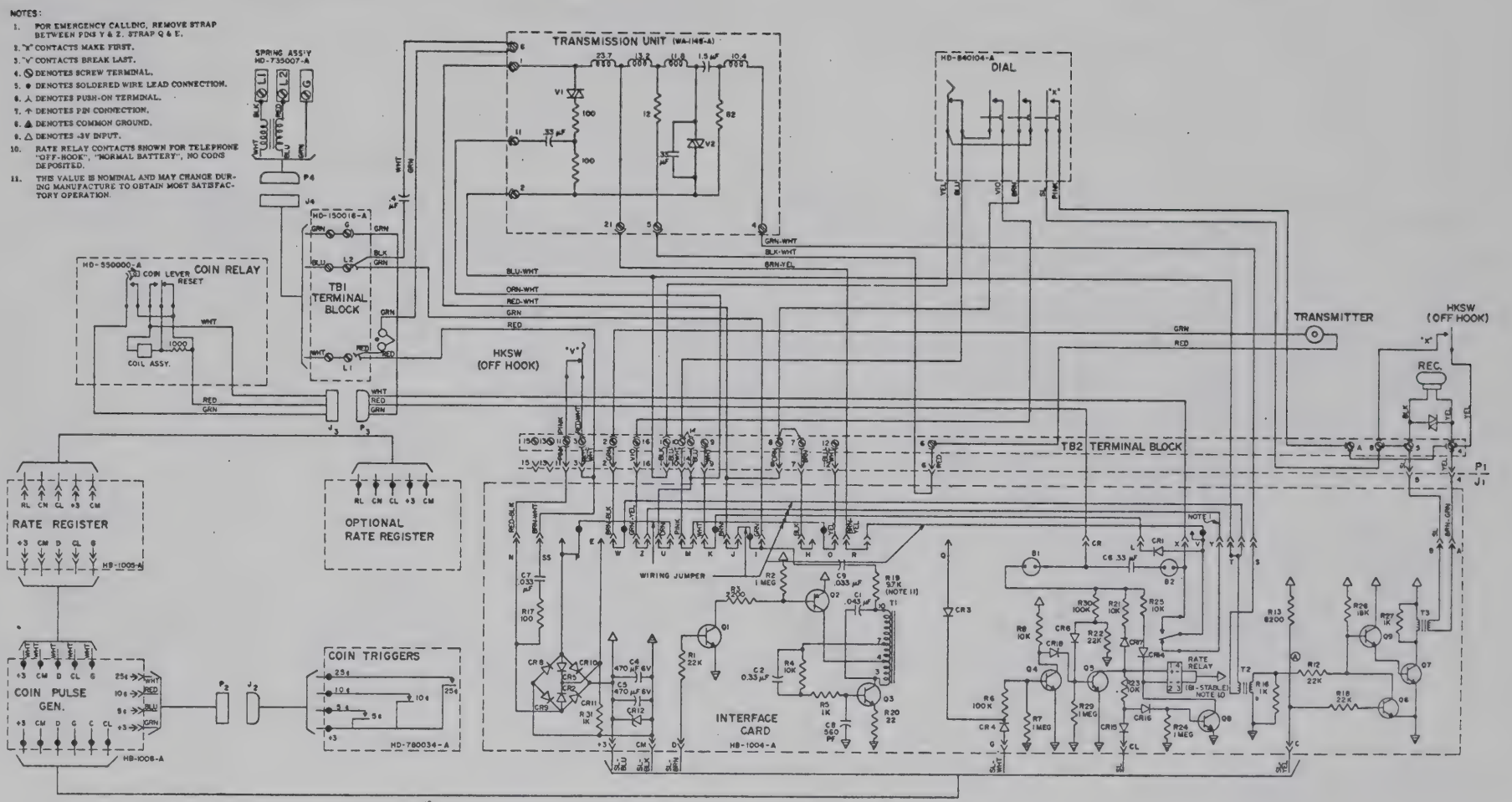


Figure 10. Wiring Diagram Type 120A Prepay Coin Telephone Set Equipped with Rotary Dial.

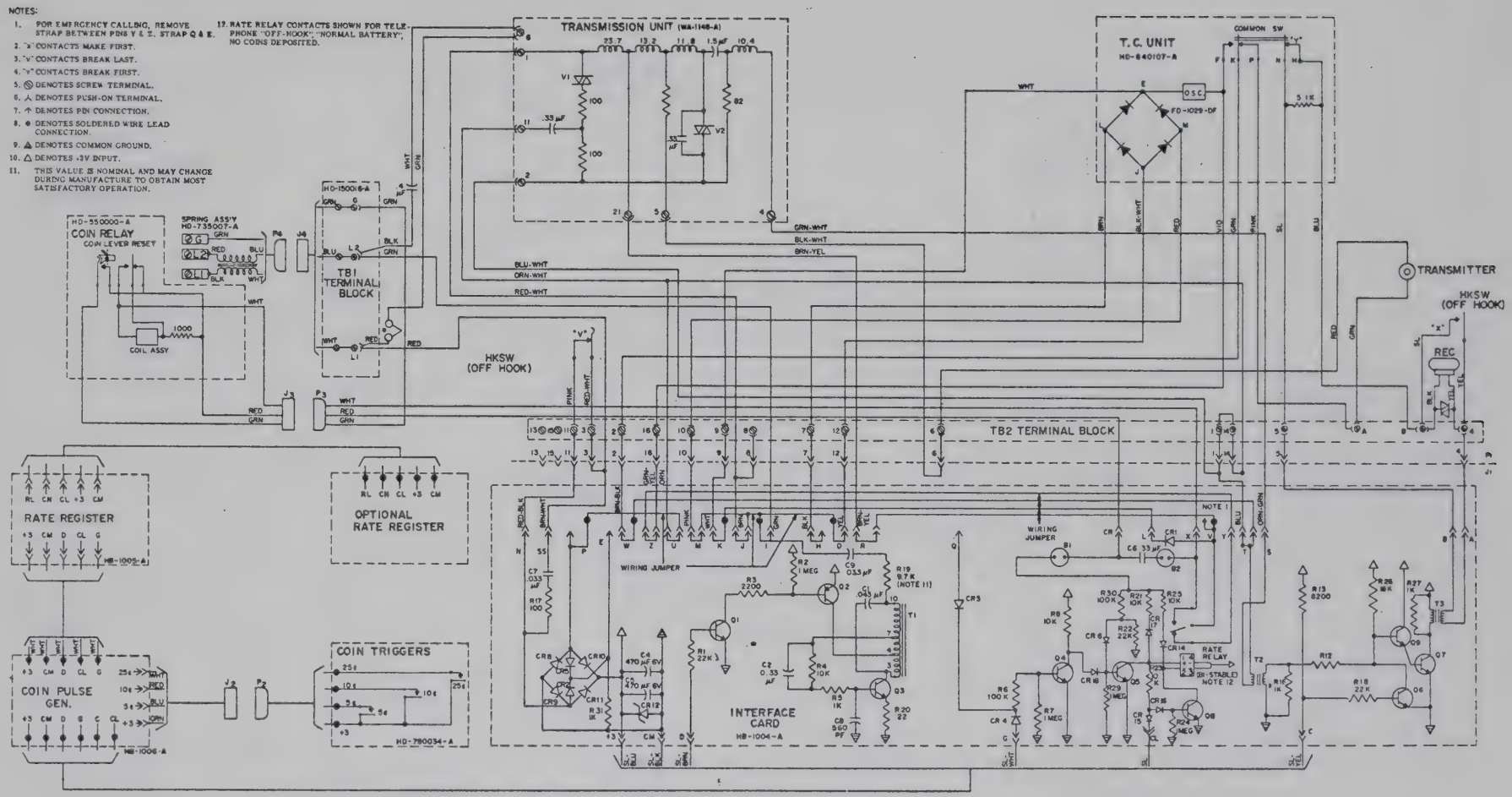


Figure 11. Wiring Diagram Type 120A Prepay Coin Telephone Set Equipped with Touch Calling Unit.

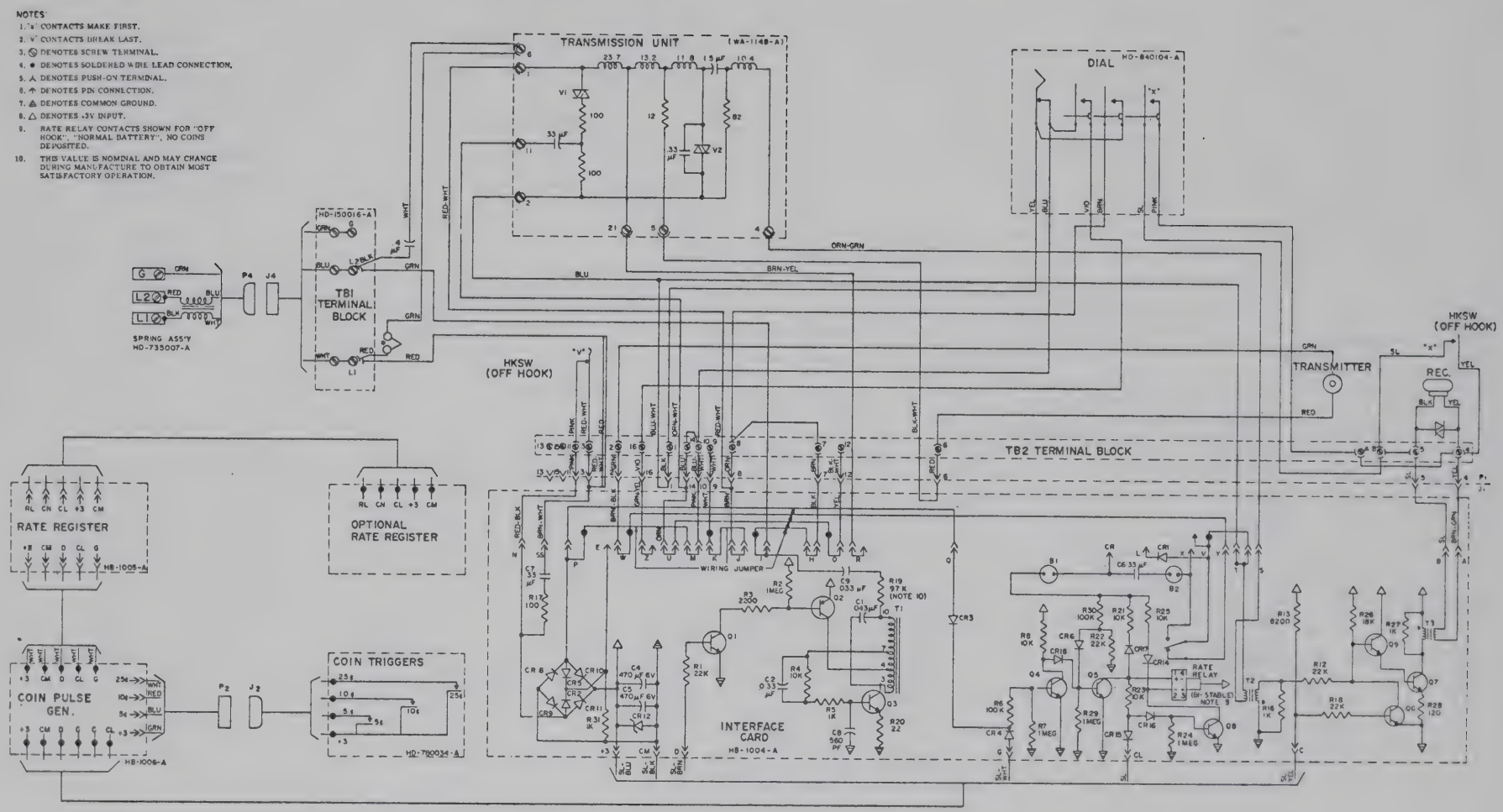


Figure 12. Wiring Diagram Type 120A Coin Telephone Set Equipped with Rotary Dial Modified for Semi-postpay Service.

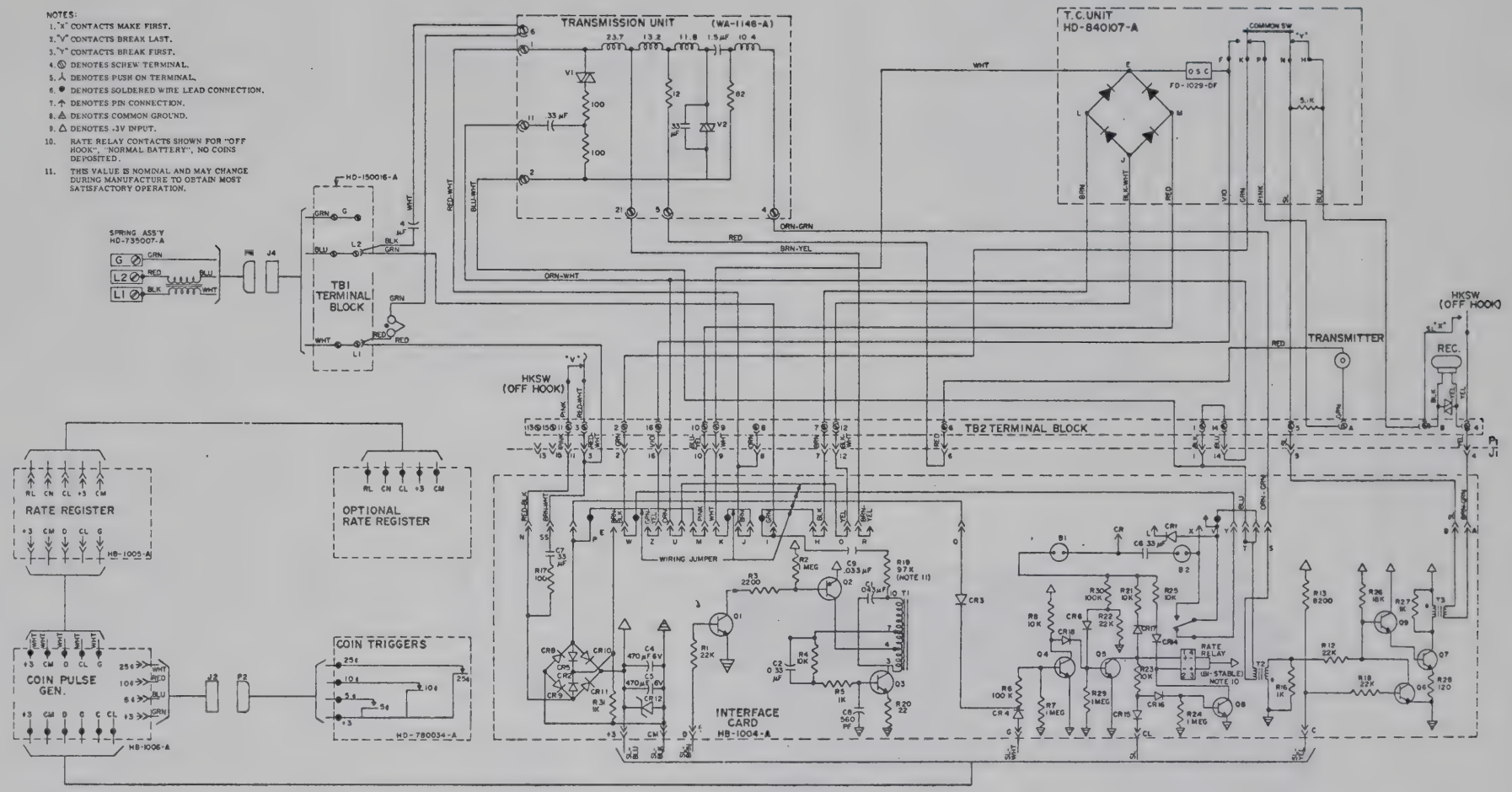


Figure 13. Wiring Diagram Type 120A Coin Telephone Set Equipped with Touch Calling Unit Modified for Semi-postpay Service.

DESCRIPTION

A.E. CO. PREPAY PAYSTATIONS

1. GENERAL

1.01 This section describes the physical characteristics and operation of types 62 and 82 prepay paystations.

1.02 Prepay paystations (see Fig. 1) are coded according to basic type. The 82 type prepay paystation has improved circuitry and supersedes the 62 type prepay paystation for procurement. A prefix LPA indicates that the paystation uses a manually adjusted loop compensating network; an LPB prefix indicates that the paystation uses a self-compensating network. The suffix -55 indicates that the paystation is equipped for 2-nickel control.

1.03 Schematic diagrams are provided in Figs. 13, 14, and 15.

2. OPERATION WITH CENTRAL OFFICE

2.01 The automatic exchange associated with the prepay paystation must be equipped with coin-control repeaters, sources of positive and negative 110-volt dc collect and refund battery, and an interrupter which results in intermittent coin-control current being applied to the line.

2.02 The calling party is connected to a paystation repeater at the central office upon removal of the handset, but cannot break dial tone until two nickels, one dime, or one quarter has been deposited. After deposit, the calling party may dial and extend a connection in the usual manner.

2.03 Upon completion of the call, the coins deposited are dropped into the cash compartment and the paystation is restored to normal automatically. When the call is not completed, the money is returned to the calling party and the paystation is restored to normal automatically.

2.04 On operator assistance calls, initial deposit is refunded upon connection to the operator. Toll operators may supervise collection of coins by audible signals picked up through a special transmitter. The operator controls the application of coin-collect and refund current on toll calls.

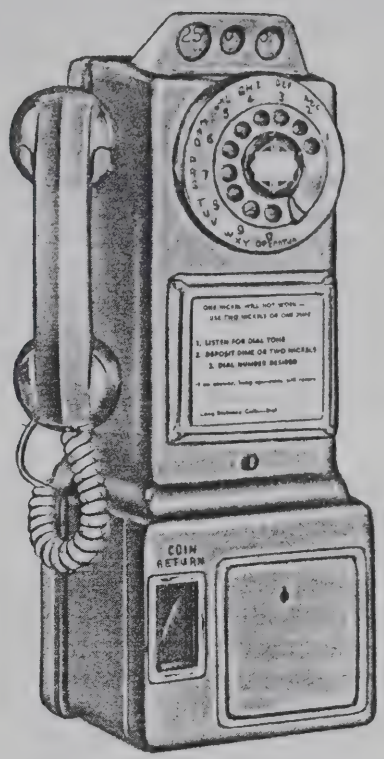


Figure 1. Prepay Paystation

3. MECHANISM

3.01 The coin gauge at the top of the upper housing consists of three different size openings: nickel, dime, and quarter. Each opening is connected to a different channel in the coin chute.

Coin Chute

3.02 The coin chute (Fig. 2) is mounted immediately below and in line with the coin gauge. The coin chute has three channels of varying sizes. The channel under the nickel gauge is larger than the dime channel and smaller than the quarter channel. Therefore, only the correct coin in its correct channel will operate the mechanism. All three channels end directly over the mouth of the coin hopper. The lugs which hold the coin chute to the upper housing are part of the framework welded to the upper housing. This framework constitutes the coin-return chute for incorrect coins. The incorrect coins will fall out of the coin chute because the depth of the particular channel on the

rear face of the coin chute is just deep enough to hold a coin of the right size. After falling out of the coin chute, the incorrect coins hit the coin-return chute and are guided to the mouth of the coin-return chute in the lower housing. On type LPB-82 and on some of the LPA-82 and 62 paystations, a permanent magnet, mounted in the quarter channel on the coin chute, acts as a slug rejector. A slug, possessing magnetic properties, is attracted by the slug rejector which prevents the slug from striking the cathedral gong. The slug is guided to the coin hopper, and later to the coin receptacle without being accepted in payment of a toll call.

Coin Signals

3.03 The bell mounted on the left side of the coin chute (as seen from the rear in Fig. 2), is so situated with respect to the nickel and dime channels that the nickel will strike and ring the bell once at the bottom of the bell. The dime will strike the bell at the top and again at the bottom, making two rings. A quarter strikes once against the cathedral gong located to the right of the coin chute (as seen from the rear in Fig. 2). The tones of the bell and the gong are easily distinguished by the operator at the central office. A transmitter, also shown in Fig. 2, conveys these signals to the operator.

Two-Nickel Control

3.04 Prepay paystations arranged for ten-cent service must be equipped to enforce the deposit of 2 nickels or 1 dime before a local call can be made. (This does not apply to prepay paystations equipped for five-cent service.) Enforcement of the correct initial deposit is accomplished by the microswitch shown in Fig. 3. The microswitch is mounted on the coin chute with an extension of the wire operating arm in the nickel channel.

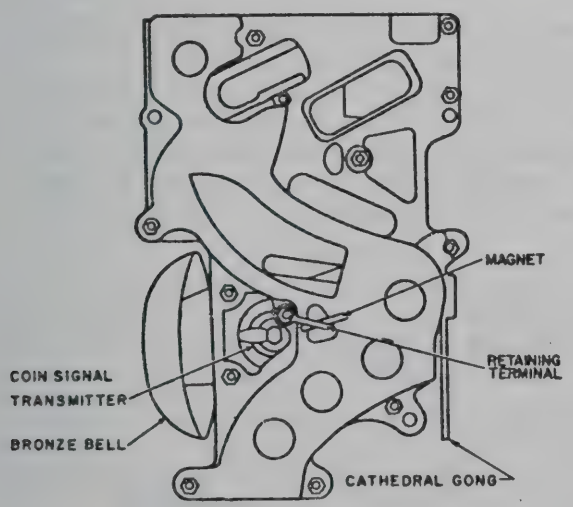


Figure 2. Coin Chute (Rear View)

3.04-a The first nickel slides the operating arm down along the edge of the pendulum, pushing it somewhat below the pendulum notch. Gravity then draws the narrow bottom of the pendulum against the microswitch operating arm. When the first nickel passes beyond the arm, spring tension in the microswitch lifts the arm into the notch where it latches as shown in the right-hand illustration of Fig. 3. The action of the operating arm short-circuits the dial pulse-springs.

3.04-b When the caller deposits the second nickel, it strikes the operating arm, pushing it down. The arm rides along the cam-like surface out of the notch, and throws the pendulum abruptly to the left. As the coin moves on, spring tension in the microswitch raises the operating arm to normal. By the time the pendulum swings back against the operating arm, the arm is above the position where it could relatch. The microswitch then restores and removes the short circuit from the dial pulse-springs. The caller can now dial.

3.04-c If a dime (or quarter) is used in the paystation, these operations do not occur; the pendulum and microswitch function only when the nickel slot is used.

3.04-d Immediately above the microswitch is the restoring magnet (Fig. 3). Since the restoring magnet is in series with the coin relay the restoring magnet operates every time the central office sends coin-collect or refund battery. In the event that either a single nickel (in the case of an abandoned call) or an odd number of nickels (in the case of a toll call) have been deposited, the armature extension of the energized restoring magnet moves the pendulum to the left and allows the microswitch operating arm to restore and reset the mechanism for the next call. If one nickel is inserted and the caller hangs up, the nickel is refunded. The shock lever is a protective device. If the paystation is given a blow after one nickel has been inserted, in an attempt to set the mechanism for a call with only one nickel, the shock lever moves over and stops the pendulum from moving and the

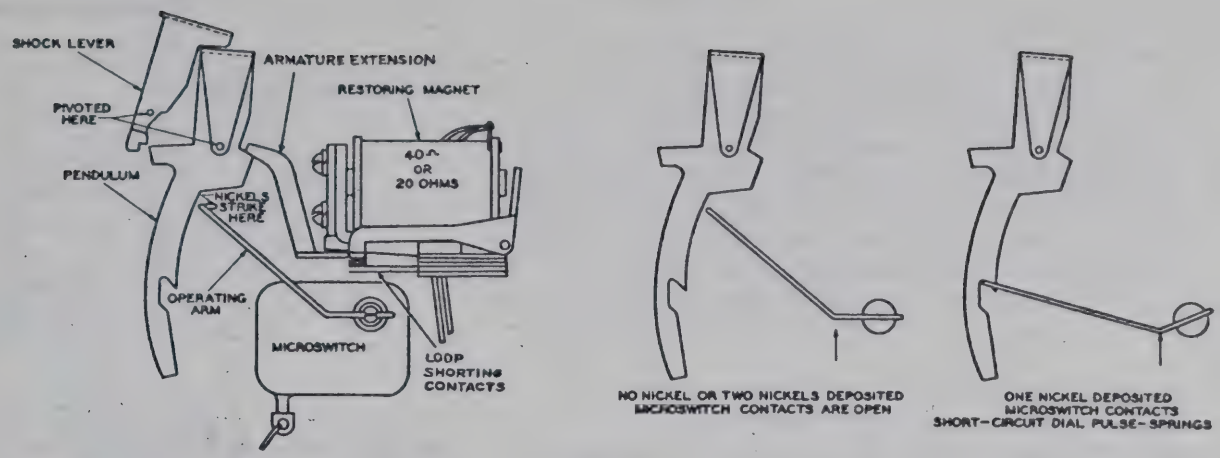


Figure 3. Two-Nickel Assembly

microswitch operating arm remains latched. Loop shorting contacts are installed on the restoring magnet where line loops exceed 500 ohms. The shorting contacts are required because battery current applied over a high resistance loop would be insufficient to operate the coin relay. When the restoring magnet operates on coin-collect or refund battery, the loop shorting contacts close setting up a short circuit across L1 and L2 thereby providing parallel paths (L1 and L2) for the application of battery potential to the paystation.

Coin Hopper

3.05 Fig. 4 shows the internal mechanism of the coin hopper with the housing removed. Figs. 5, 6, and 7 show typical operation of the hopper.

3.05-a As the coin leaves the coin chute, it enters the coin hopper mouth and operates the coin trigger. The coin trigger opens a set of dial shunt springs to allow the calling party to dial after the deposit of a dime or quarter (see Fig. 5) and simultaneously completes a circuit to ground for the coin relay. The trap bottom is held up by the roller of the deflecting vane, and the coin remains on the trap bottom.

3.05-b The projection of the deflecting vane is engaged with the fork of the operating arm of the coin relay. When current from the central office operates the relay, the fork of the operating arm moves to the right or left depending upon the voltage and polarity of the current.

3.05-c The fork in moving to the left or right carries the projection of the deflecting vane with it, and since the projection is part of

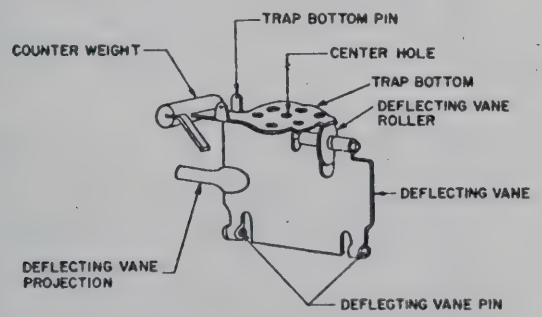


Figure 4. Coin Hopper Trap and Vane Assembly

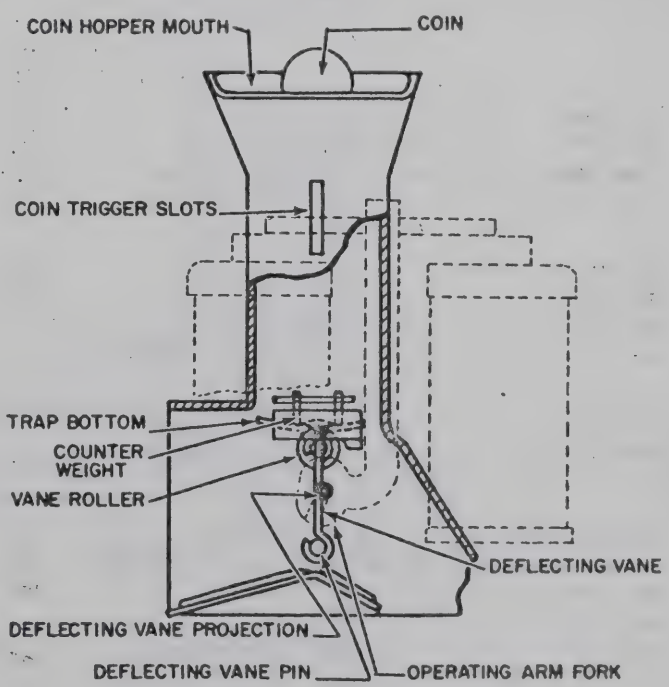


Figure 5. Trap and Vane in Normal Position

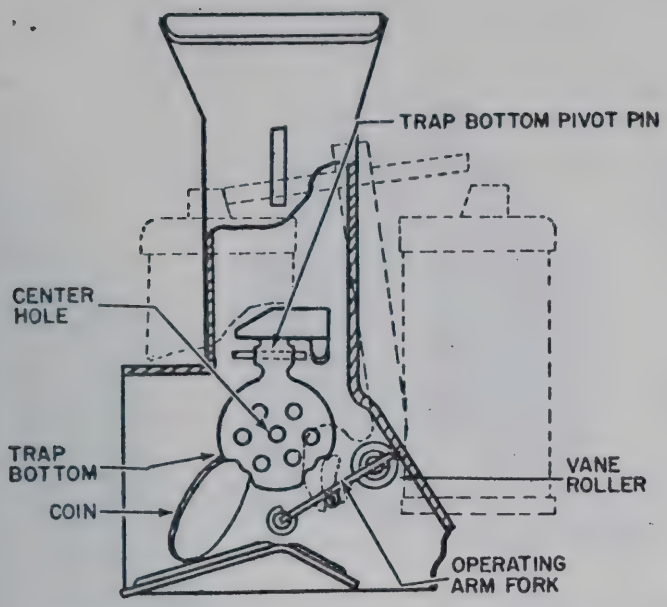


Figure 6. Trap and Vane in Refund Position

the deflecting vane, the vane must also move to the left or right. As the deflecting vane moves under the control of the fork, the roller moves from beneath the trap bottom. The weight of the coin overcomes the resistance of the counterweight, the trap bottom falls down, pivoting on its pin, and the coin slides off the trap bottom and is deflected by the deflecting vane to the left into the coin return chute or to the right into the cash compartment.

3.05-d On an unanswered local call, after the calling party hangs up, -110 volts dc is placed on the tip and ring of the line by the central office equipment, operating the coin relay. The operating arm fork moves to the right and positions the deflecting vane to deflect the coins into the refund compartment (see Fig. 6). On a completed local call, (after the calling party hangs up), a +110-volt dc pulse is applied to the tip and ring of the line and operates the coin relay. Coin relay operation causes the operating arm to move to the left, which positions the deflecting vane to deflect the coin into the cash compartment (see Fig. 7).

3.05-e After the coin has dropped, the trap-bottom counterweight returns the trap bottom to the horizontal position. Control current is then removed and the coin relay restores allowing the operating arm to return to the vertical position. The deflecting vane returns to the vertical position (see Fig. 5) to support the trap bottom.

Coin Relay

3.06 The coin relay (see Fig. 8) consists of two 510 ohm coils, a permanent magnet between coils, and a centrally located armature mounted above the coils and magnet. The armature will pivot to either side as determined by the polarity of the direct current applied to the relay coils. The position of the armature controls coin collection and refund. Various stages of coin relay operation are illustrated in Figs. 9, 10, 11, and 12.

3.06-a The operating arm assembly, pivoted in the center, is mounted on top of the armature. It consists of the fork (see Fig. 8) that engages the deflecting-vane projection (the horizontal portion of the operating arm is in contact with the armature), and restoring lever. The restoring lever carries the stud that operates the ground-switch springs. Restoring levers (see Fig. 8) are located above the operating arm and are pivoted on the same pin as the operating arm and armature. The restoring levers are in contact with the operating arm and are also connected to the restoring springs (see Fig. 9) which provide a spring bias. The restoring levers insure that the operating arm will return to a horizontal position upon removal of direct current from the coils. A switch lever is pivot-mounted on the coin relay frame. One end of the switch lever rests on the latch of the coin

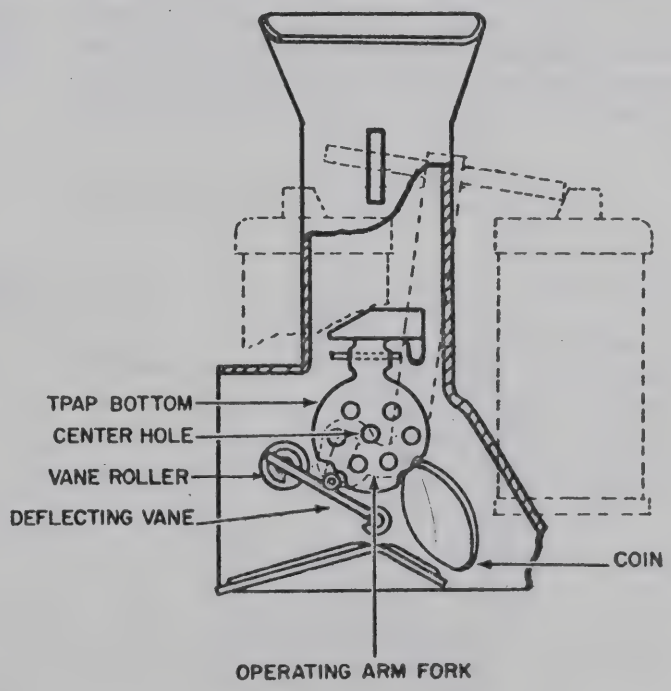
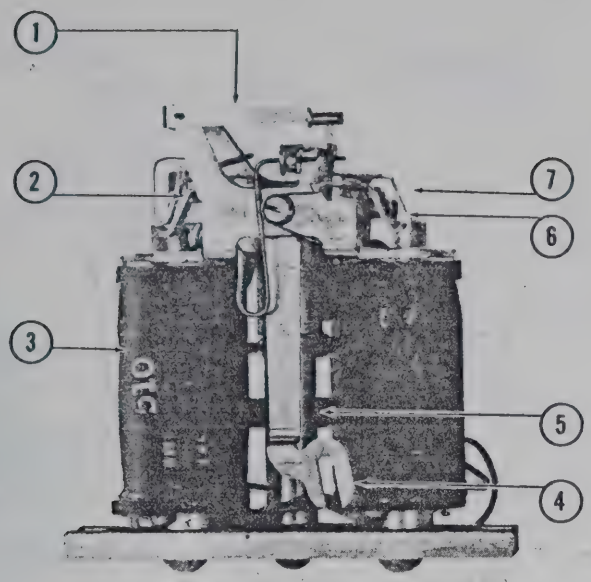


Figure 7. Trap and Vane in Collect Position



1. Switch lever
2. Restoring lever
3. Relay coils
4. Operating-arm fork
5. Magnet heelpiece
6. Armature
7. Restoring lever

Figure 8. Coin Relay (Rear View)

trigger. The other end has a half round set (see Fig. 9) to allow the stud of the restoring arm to restore the switch lever when required. The coin trigger, also pivot-mounted on the coin relay frame, is counter-balanced so that it always returns to the horizontal position when not restrained. The tip of the coin trigger protrudes through the slot in the front and rear of the coin hopper. A coin cannot pass through the coin hopper without tripping the coin trigger.

3.06-b Fig. 9 shows the relay and ground-switch springs in position before any coins have been deposited. The ground-switch contacts are open and the dial-shunt springs are closed preventing dial pulses from being sent to the central office. A deposited coin drops down the coin hopper and forces the coin trigger down. The coin trigger latch moves away from the switch lever and the switch lever drops slightly. When the switch lever is in this position, the coin trigger latch butts against the switch lever and cannot return to its horizontal position. The end of the switch lever with the half round set moves to the right and simultaneously closes the ground-switch contacts and opens the dial shunt contacts (see Fig. 10). The restoring-arm stud remains in the center. The dial can now send pulses, unless a first nickel was deposited. If a first nickel was deposited, the microswitch places a shunt across the dial, preventing pulses from reaching the central office until the second nickel has been deposited (see paragraph 3.04). When a dime or quarter is deposited, the coin relay has opened the path for dial pulses and there will be no dial shunt.

3.06-c When a caller hangs up after an incompleted local call, -110 volts dc is applied to the tip and ring of the line. This polarity reversal causes the armature to pivot to the left (see Fig. 11). The operating arm fork moves the deflecting vane to the right, allowing the trap bottom to drop. The deflecting vane guides the coins to the refund chute. Simultaneously, the operating-arm stud moves up out of the area of

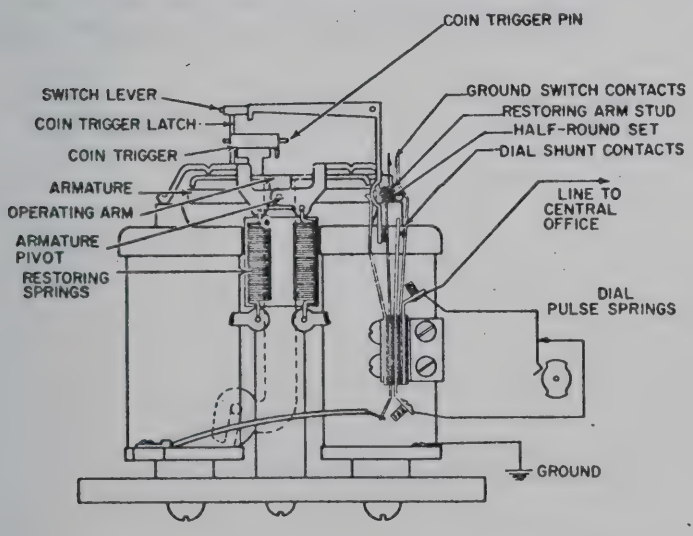


Figure 9. Coin Relay - Paystation Idle

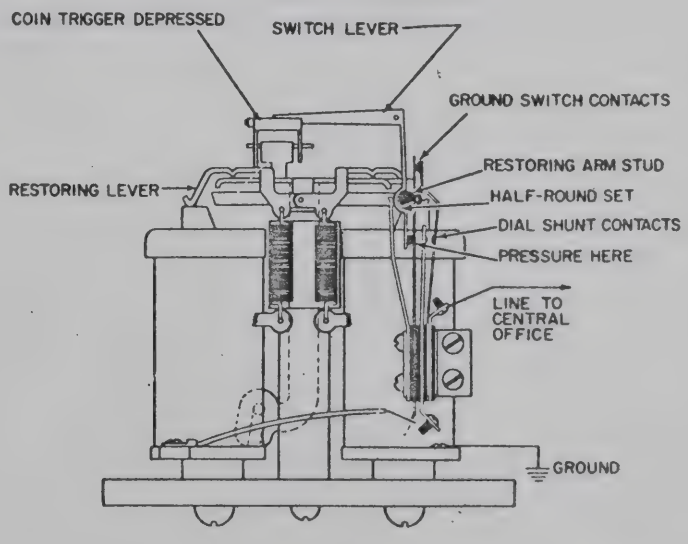


Figure 10. Coin Relay - Coin Trigger Tripped

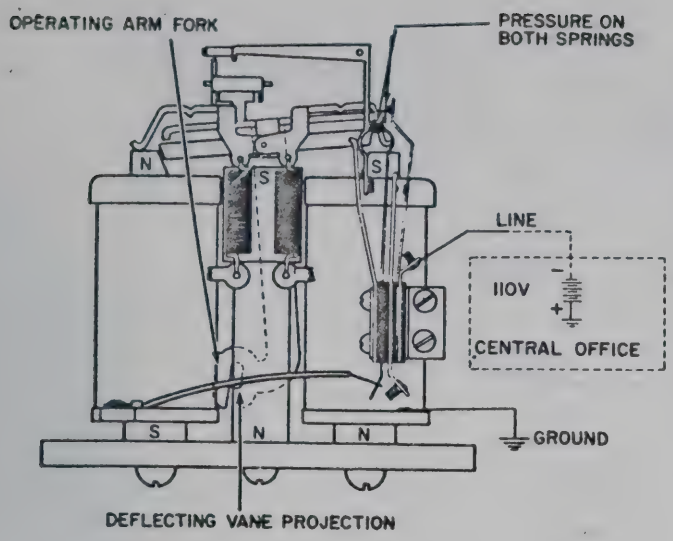


Figure 11. Coin Relay - Refund Position

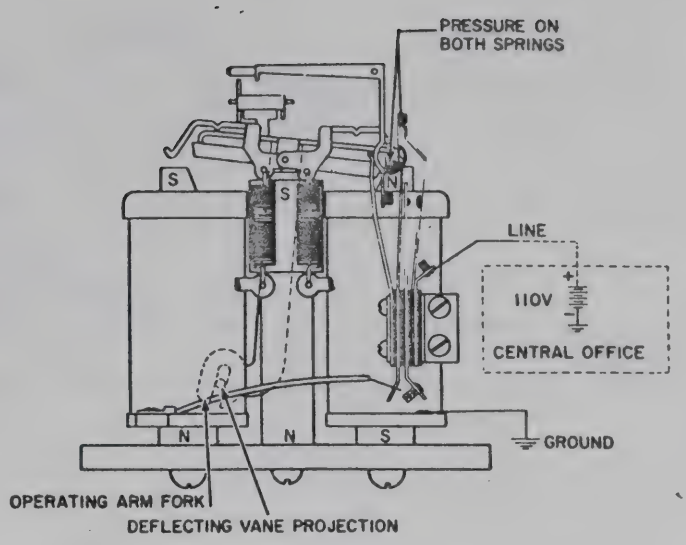


Figure 12. Coin Relay - Collect Position

the two half round sets in the switch lever and the ground-switch spring. The operating-arm stud forces the half round end of the switch lever to the left which allows the other end of the switch lever to move up away from the latch of the coin trigger. The coin trigger then returns to its normal horizontal position.

3.06-d The operating arm stud also insures (through counter-tension of opposing springs) that ground-switch-spring contacts remain closed throughout the operation. When the -110 volts dc is removed from the line, the switch lever will rest on the coin trigger projection causing the ground-switch contacts to open and the dial shunt contacts to close. The restoring lever and restoring springs move the armature to the horizontal position. See Fig. 9.

3.06-e When a caller hangs up after a completed local call, +110 volts dc is applied to the tip and ring of the line. The armature will pivot to the right (see Fig. 12). The operating arm fork moves the deflecting vane to the left allowing the trap bottom to drop. The deflecting vane guides the coins to the cash department. Ground-switch contacts remain closed. When the +110 volts dc is removed from the line, the restoring lever and restoring springs move the armature to the horizontal position.

NOTE: On operator calls, initial deposit is refunded as soon as connection is made with the operator. Coin relay operation is otherwise the same as on caller dialed calls, except that collect and refund current is controlled by the toll operator.

NOTES:
1. "X" CONTACTS BREAK FIRST, MAKE LAST.
2. ⊗ JACK CONNECTIONS BETWEEN UPPER AND LOWER HOUSINGS.
3. ○ TERMINAL BLOCK CONNECTIONS.
4. MICROSWITCH AND RESTORING MAGNET PROVIDED ON 62-55 ONLY.

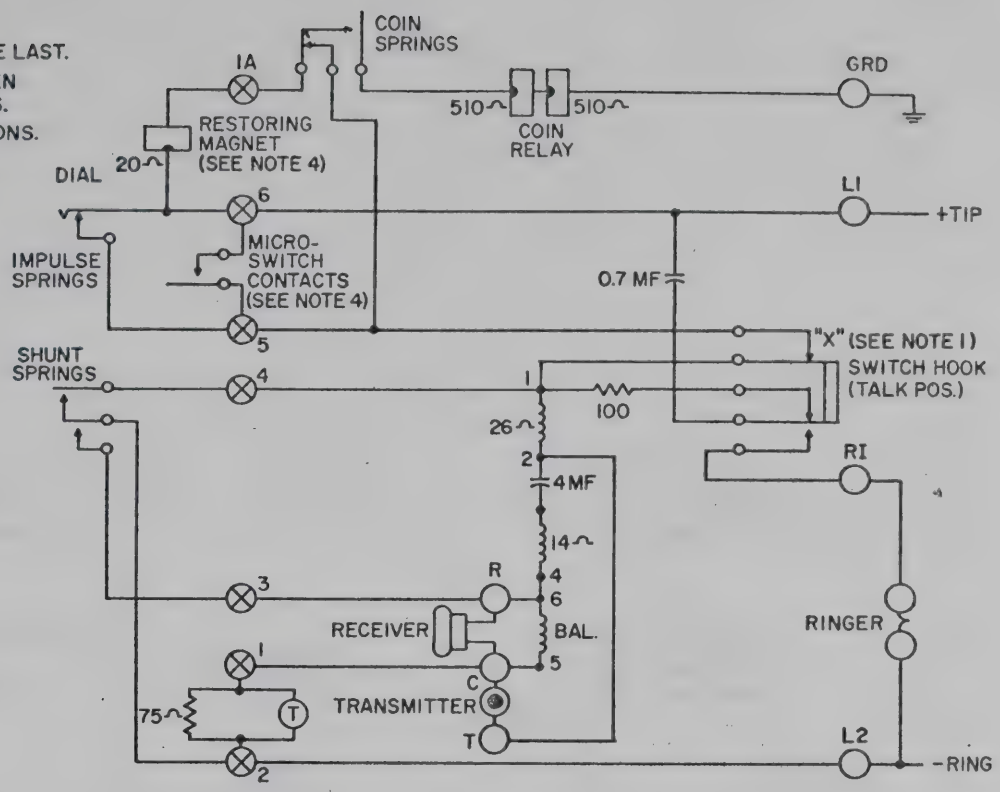


Figure 13. Type 62 Prepay Paystation - Schematic Diagram

NOTES:
1. "X" CONTACTS BREAK FIRST, MAKE LAST.
2. LOOP COMPENSATOR SET AT 2 FOR LESS THAN 200Ω LOOPS AND AT ZERO FOR OVER 200Ω.
3. SIDETONE BALANCING IMPEDANCE USED ON UNLOADED CABLE LOOPS OF OVER 200Ω PROVIDING ANY ADJACENT OPEN WIRE SECTION IS LESS THAN 200Ω.
4. ⊗ JACK CONNECTIONS BETWEEN UPPER AND LOWER HOUSINGS.
5. ○ TERMINAL BLOCK CONNECTIONS.
6. ON LOOPS ABOVE 500Ω, CONNECT LOOP SHORTING CONTACTS.
7. MICROSWITCH AND RESTORING MAGNET PROVIDED ON LPA-82-55 ONLY.

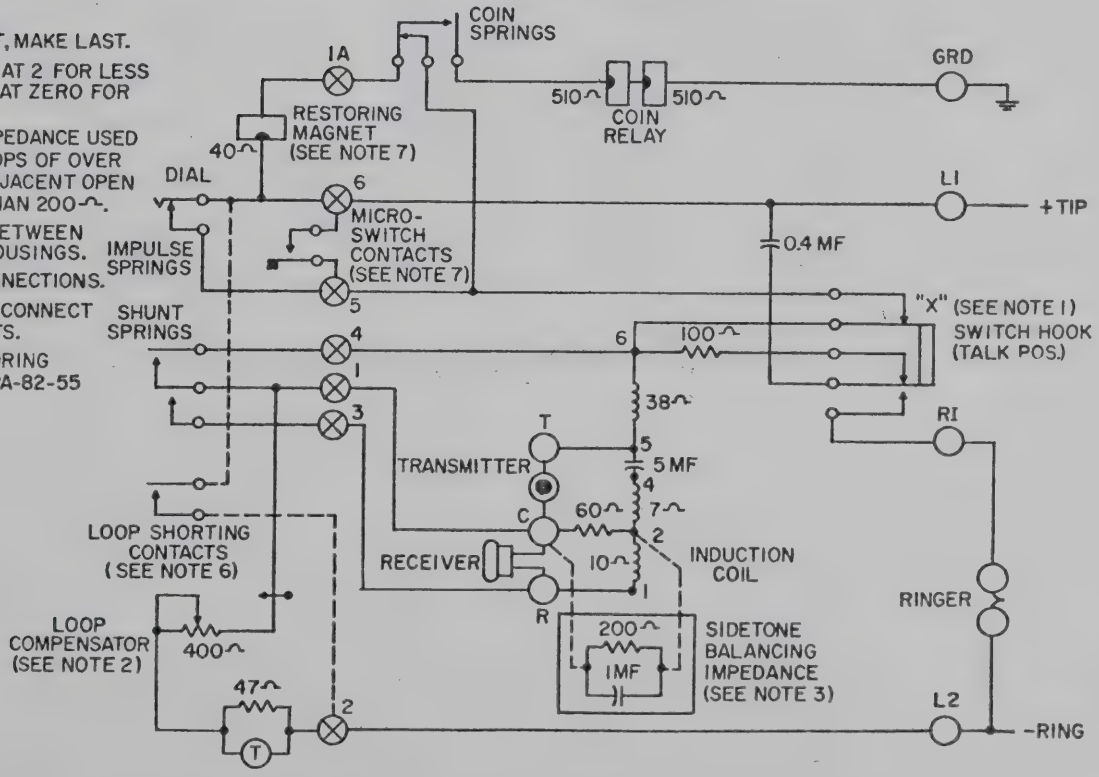


Figure 14. Type LPA-82 Prepay Paystation - Schematic Diagram

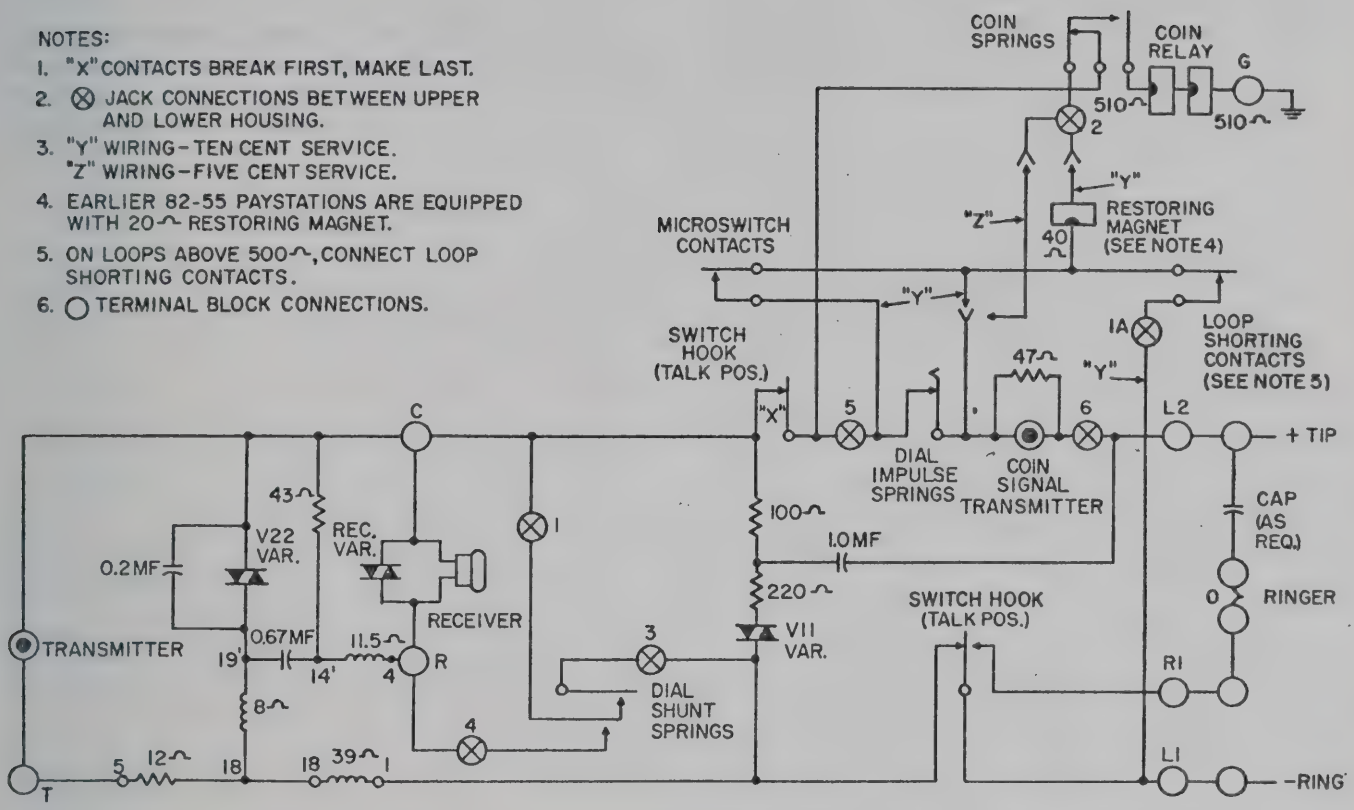


Figure 15. Type LPB-82 Prepay Paystation - Schematic Diagram

A.E. CO. LPB82-SERIES COIN TELEPHONE SETS CONNECTIONS

1. GENERAL

1.01 This section provides connection drawings for LPB82-series coin telephone sets. These are prepay instruments with the components of a varistor-regulated transmission network distributed among the wires in the cable form and connected to an induction coil having screw terminals. Sets manufactured after July, 1967, are equipped with a single-coil coin relay assembly, as shown in the main body of each drawing. Those of earlier manufacture use the original two-coil assembly shown as an alternate; either may be found on rebuilt instruments.

1.02 Figure 1 shows the wiring of the LPB82 set for single-nickel service in dial or manual offices, and Figure 2 the wiring of the LPB82-55 set, which requires a dime or two-nickel deposit. Figure 3 applies to a small number of factory-built and to shop-rebuilt sets based on the LPB82-55 (dial) assembly, but provided with a Touch Calling unit mounted in a stainless steel extension housing over the normal dial location. Figure 4 covers LPB82-55 instruments modified for mounting behind a Type 101 panel, and Figure 5 the same assembly arranged for Touch Calling service.

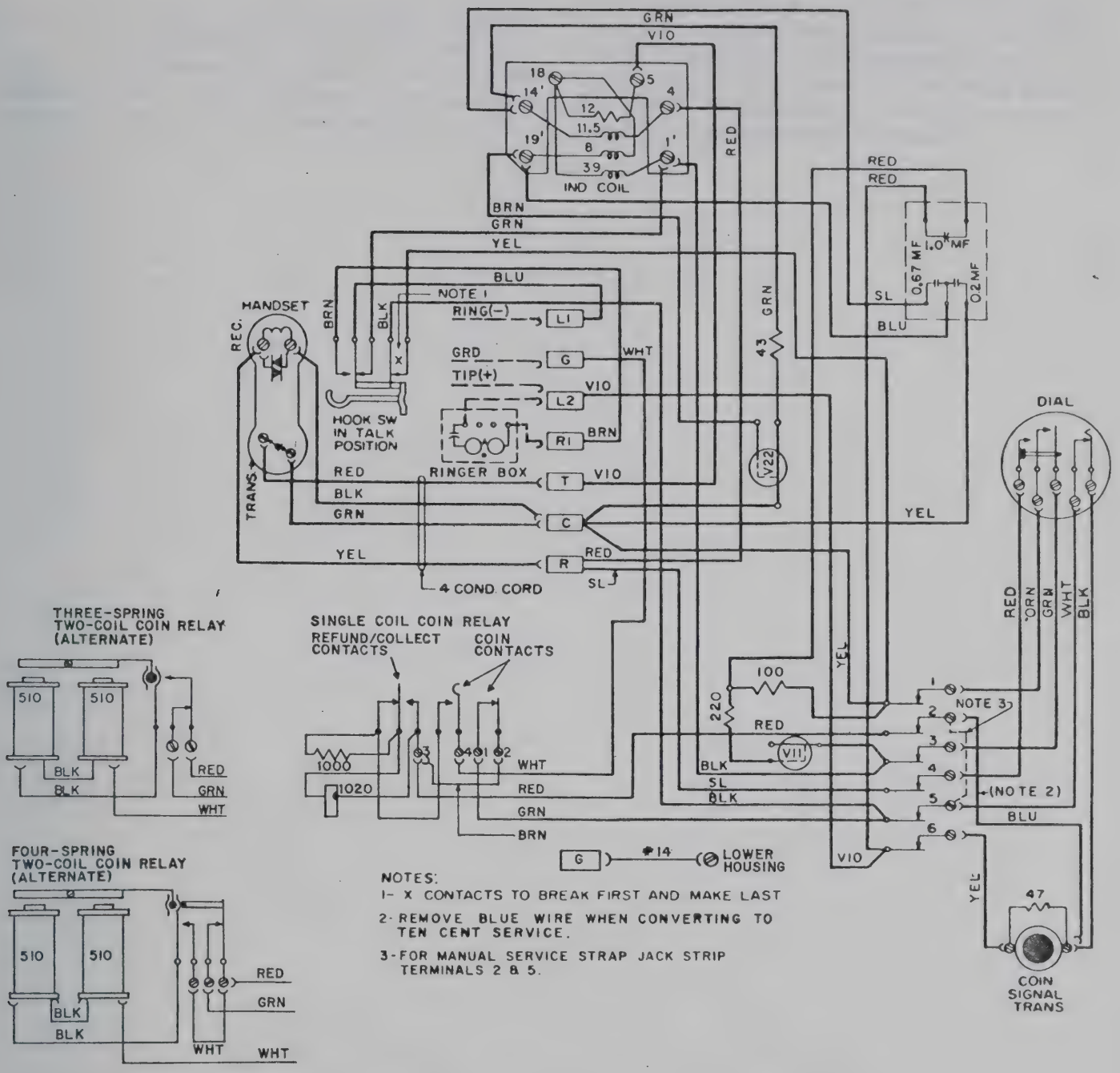
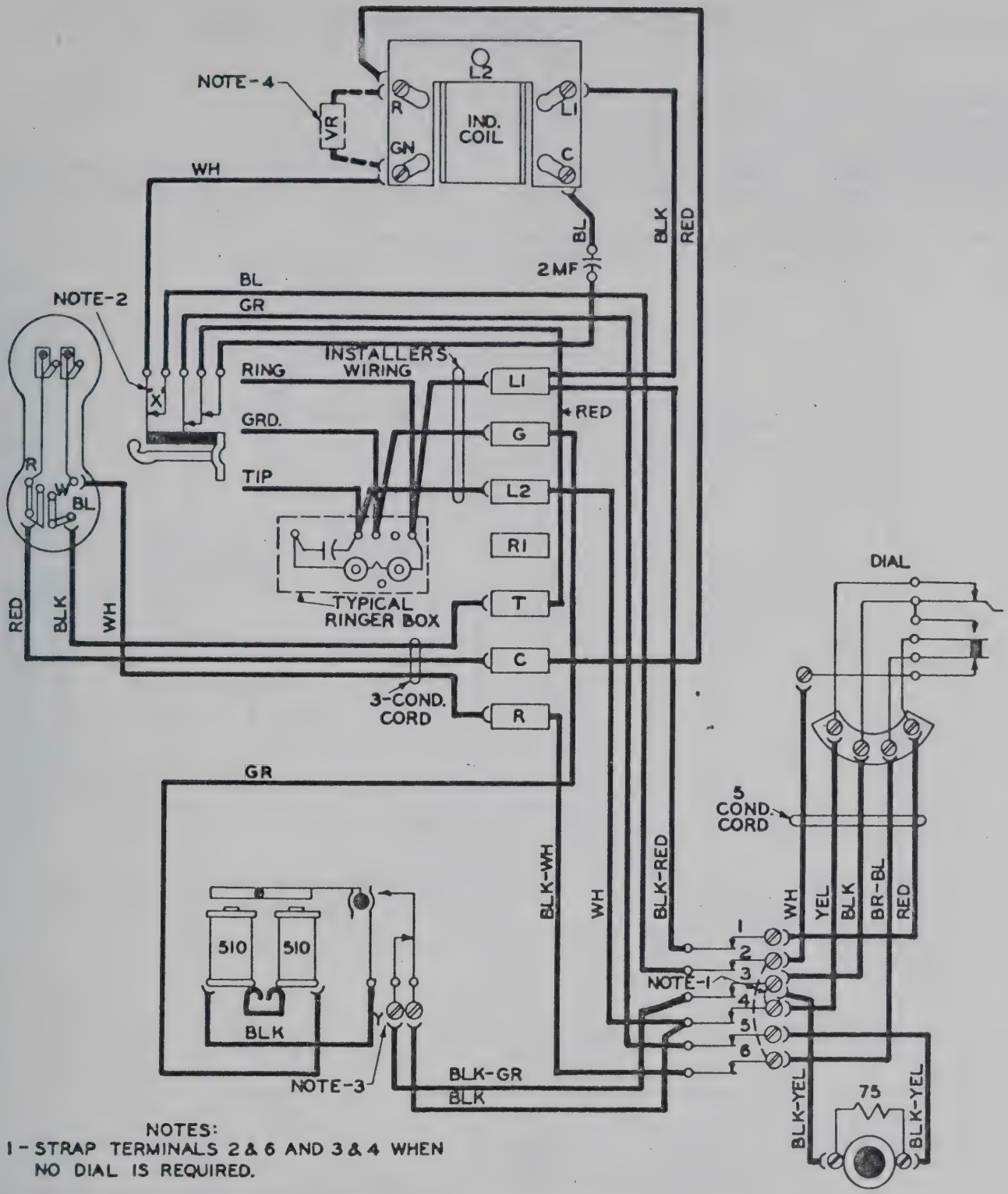


Figure 1. Wiring Diagram, LPB82 Coin Telephone Set.

A.E.CO. 92-N AND 92-W PREPAY COIN TELEPHONE SETS CONNECTIONS

1. GENERAL

1.01 This section provides connection drawings for Types 92-N and 92-W coin telephone sets. The 92 series coin telephone sets provide prepay service. The 92-N and 92-W sets are equipped with F1A type components. The 92-W sets have W.E.Co. dials and the 92-N sets have A.E.Co. dials. Figure 1 shows the wiring diagram for a set equipped for single-nickel service. The wiring diagram for a set equipped for two-nickel service is shown in Figure 2. The wiring diagram for a 92-N set arranged for dime-only service in a manual exchange is shown in Figure 3.



NOTES:

1 - STRAP TERMINALS 2 & 6 AND 3 & 4 WHEN NO DIAL IS REQUIRED.

2 - CONTACT "X" TO BREAK FIRST & MAKE LAST.

3 - WHEN USED WITH REPEATERS THAT DO NOT REQUIRE A SHUNTED DIAL CONTROL, DISCONNECT CLIP "Y."

4 - VARISTOR "VR" USED WHEN SPECIFIED.

5 - TAPE LEADS NOT USED.

Figure 1. A.E.Co. 92-N and 92-W Coin Telephone Sets — Wiring Diagram.

A.E.CO. LPA92-SERIES PREPAY COIN TELEPHONE SETS CONNECTIONS

1. GENERAL

1.01 This section provides a connection drawing for LPA92-series prepay coin telephone sets. LPA92 sets are equipped with G1A components providing self-compensating type loop adjustment. Figure 1 is a wiring diagram for an LPA92-55 coin telephone set. The diagram includes instructions for modifying the set to provide one-nickel service.

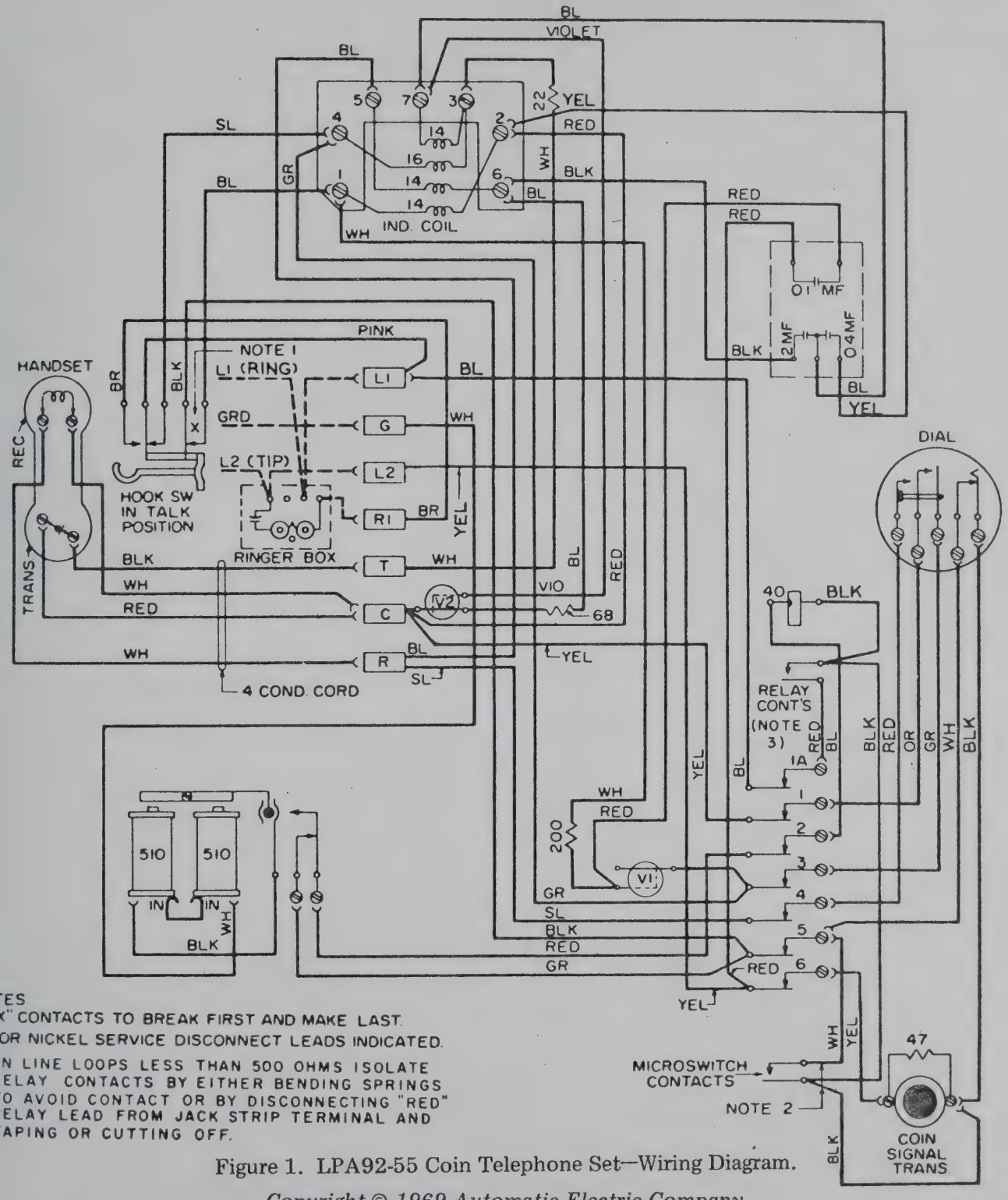


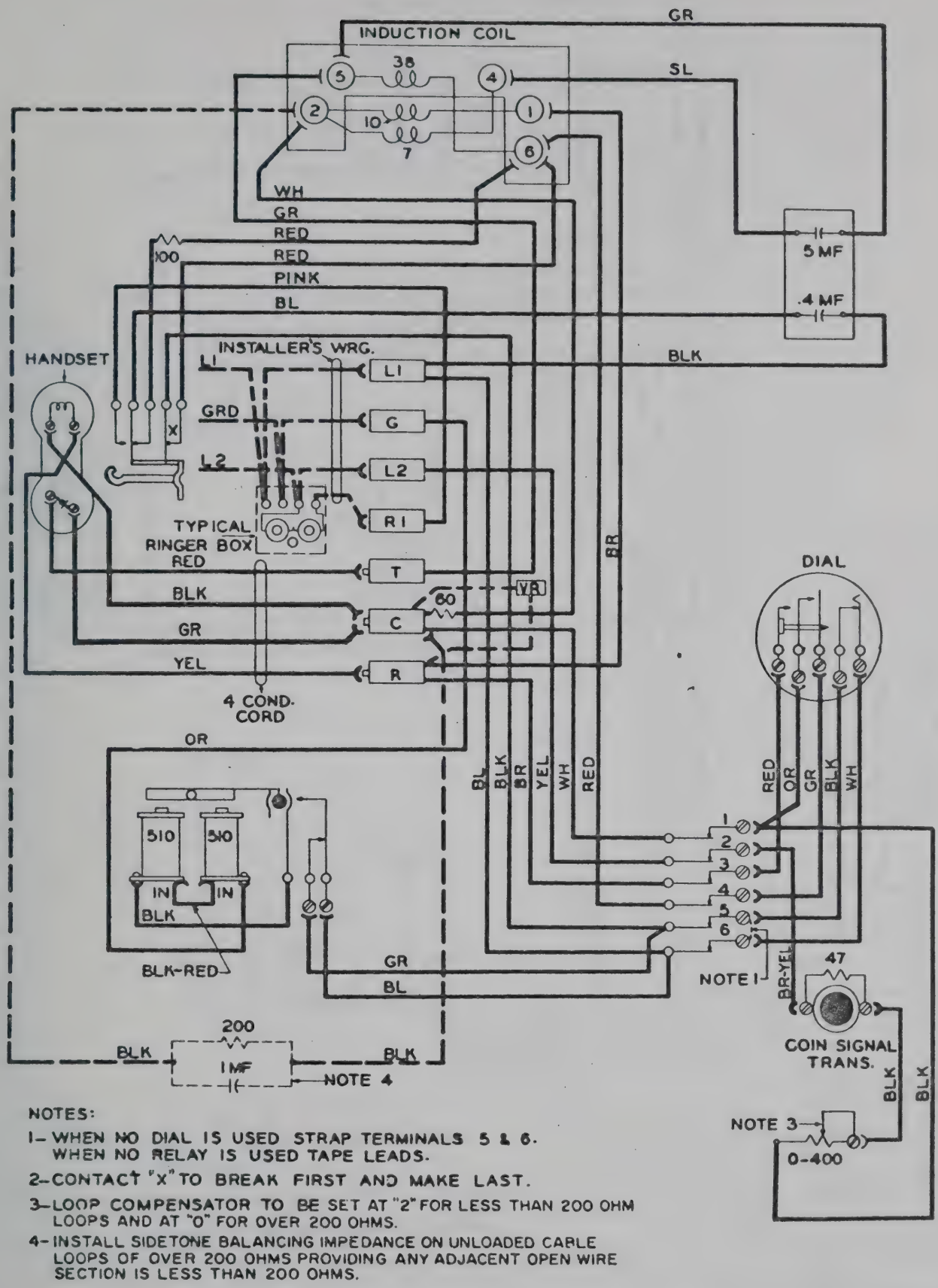
Figure 1. LPA92-55 Coin Telephone Set—Wiring Diagram.

SECTION 476-202-401
ISSUE 1, NOVEMBER, 1969
GT&E STANDARD

A.E.CO. LPA82-SERIES PREPAY COIN TELEPHONE SETS CONNECTIONS

1. GENERAL

1.01 This section provides connection drawings for LPA82-series prepay coin telephone sets. LPA-series coin telephone sets are arranged for manually-adjusted loop compensation. Figure 1 shows the wiring diagram for an LPA82 set equipped for single-nickel service. The wiring for a set equipped for dime or two-nickel service is shown in Figure 2. The wiring diagram for an LPA82 set designed for dime-only service in a manual exchange is shown in Figure 3.



NOTES:

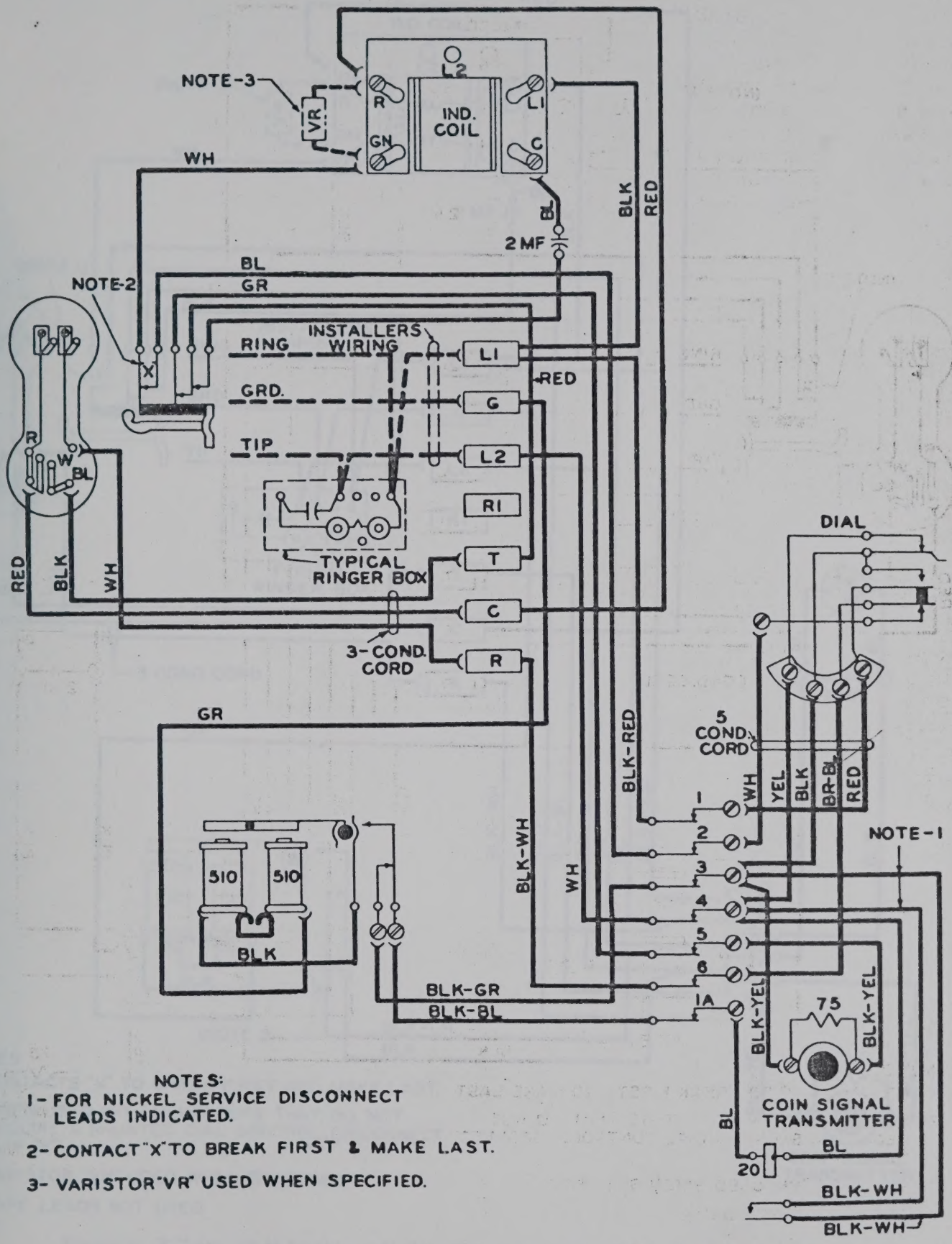
1– WHEN NO DIAL IS USED STRAP TERMINALS 5 & 6. WHEN NO RELAY IS USED TAPE LEADS.

2–CONTACT "X" TO BREAK FIRST AND MAKE LAST.

3–LOOP COMPENSATOR TO BE SET AT "2" FOR LESS THAN 200 OHM LOOPS AND AT "0" FOR OVER 200 OHMS.

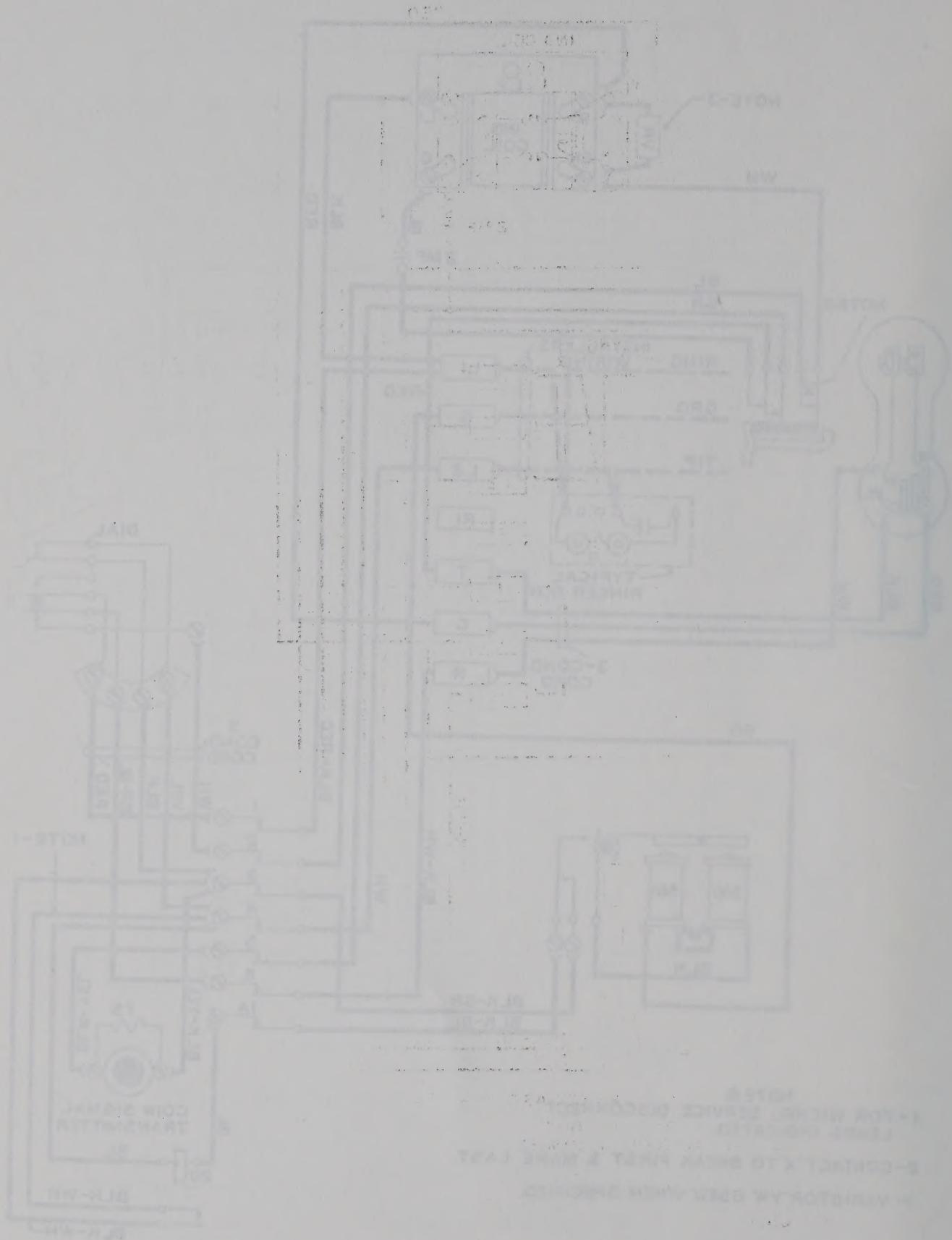
4–INSTALL SIDETONE BALANCING IMPEDANCE ON UNLOADED CABLE LOOPS OF OVER 200 OHMS PROVIDING ANY ADJACENT OPEN WIRE SECTION IS LESS THAN 200 OHMS.

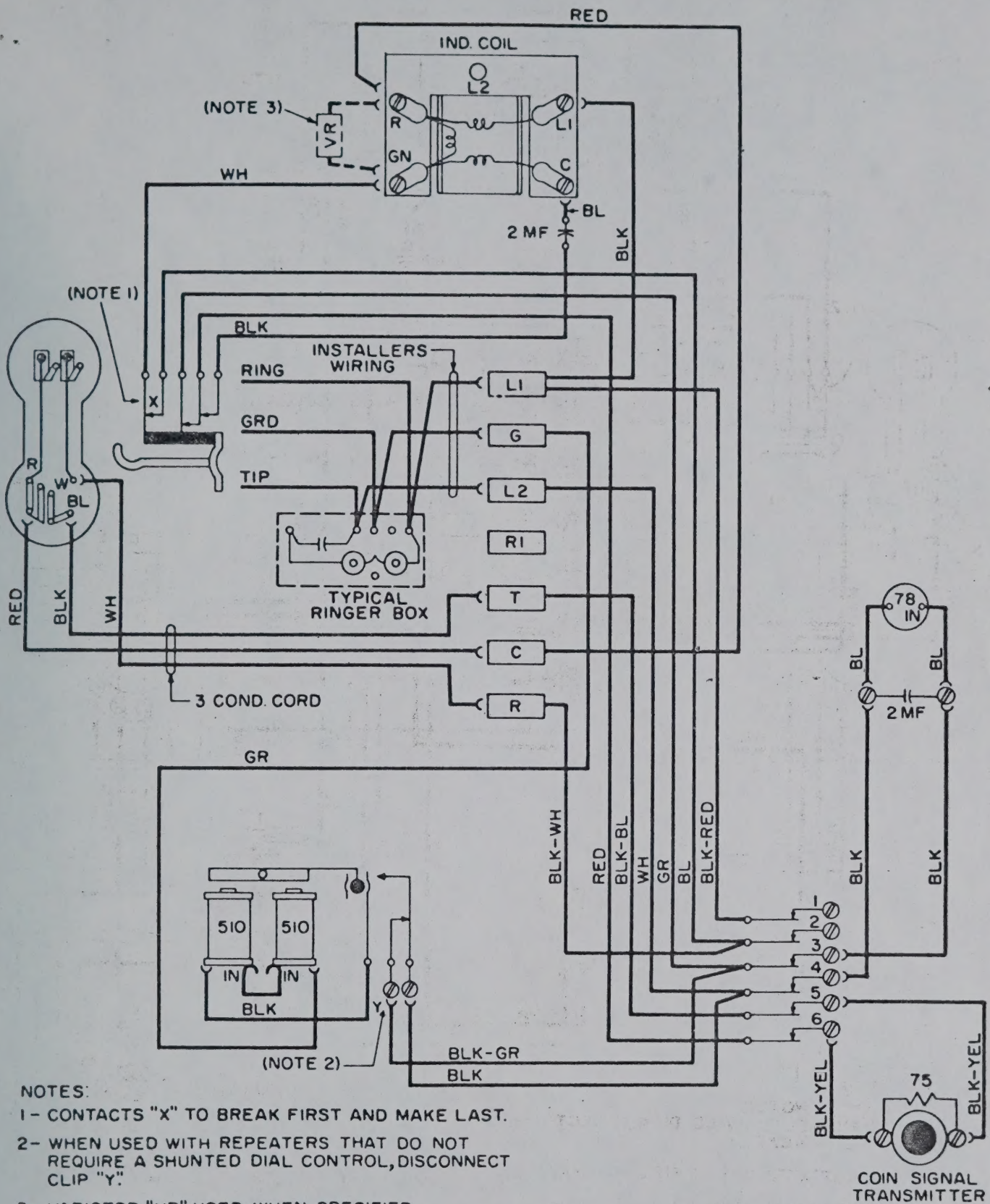
Figure 1. LPA82 Coin Telephone Set — Wiring Diagram.



NOTES:
1- FOR NICKEL SERVICE DISCONNECT LEADS INDICATED.
2- CONTACT "X" TO BREAK FIRST & MAKE LAST.
3- VARISTOR "VR" USED WHEN SPECIFIED.

Figure 2. A.E.Co. 92-N-55 and 92-W-55 Coin Telephone Sets — Wiring Diagram.





NOTES:

1- CONTACTS "X" TO BREAK FIRST AND MAKE LAST.

2- WHEN USED WITH REPEATERS THAT DO NOT REQUIRE A SHUNTED DIAL CONTROL, DISCONNECT CLIP "Y".

3- VARISTOR "VR" USED WHEN SPECIFIED.

4- TAPE LEADS NOT USED.

Figure 3. A.E.Co. 92-N-10 (Manual) Coin Telephone Set — Wiring Diagram.